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United States
Department of
Agriculture

Office of Grants
and Program Systems

Food and Agriculture Competitively Awarded Research and Education Grants

Fiscal Year 1985

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FOOD AND AGRICULTURE
COMPETITIVELY AWARDED
RESEARCH AND EDUCATION
GRANTS

Fiscal Year 1985

UNITED STATES
DEPARTMENT OF
AGRICULTURE

PREPARED BY:
OFFICE OF GRANTS
AND PROGRAM SYSTEMS
SCIENCE AND EDUCATION

DECEMBER 1985

FOREWORD

Our country has an excellent State-Federal agricultural and forestry research partnership that has helped develop an agricultural research system that is envied the world over. The ability of our agriculture to produce efficiently and meet each new need is the result of the support of this strong, stable research system. It provides the continuing research base with the resources and continuity necessary for scientific advances on the many fronts involved in modern-day agriculture.

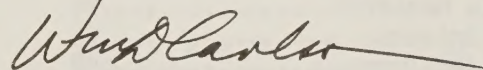
The grants reported in this publication represent still another aspect of this research system--the Competitive, Special, Forest and Rangeland Renewable Resources, Rangeland, and Small Business Innovation Research grants programs as well as the Food and Agricultural Sciences National Needs Graduate Fellowships grant program. Collectively, the focus is primarily on basic research or education to discover the information needed before we can make further important and necessary breakthroughs in our applied research programs.

Qualified scientists both inside and outside the traditional agricultural research system apply for and receive these grants. Thus, not only scientists from the Federal laboratories, the State agricultural experiment station, the schools of forestry, the 1890 universities and Tuskegee University, and the colleges of veterinary medicine, but qualified scientists from various other organizations, both public and private, participate in the programs.

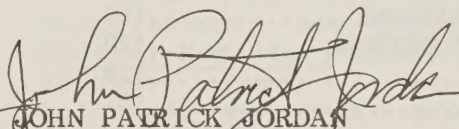
The primary aim of the mission-oriented basic research program is discovering new information needed to further significant progress in the plant sciences--photosynthesis, biological nitrogen fixation, genetic mechanisms, biological stress, biotechnology, and in human nutrition. Other areas supported by grant programs include animal health, aquaculture, soybean, and alcohol fuels research as well as food and agricultural sciences areas suitable for graduate work and small business participation.

During the Fiscal Year October 1, 1984, through September 30, 1985, 739 competitive grants totaling \$66,442,883 were awarded.

It is our belief that out of this combination of a sound, stable ongoing research system, with a viable extramural grants program to attack significant and difficult problems in agricultural science, comes the information and knowledge necessary to keep our U.S. agriculture strong and resilient--ready and able to meet any challenge that might be ahead.



WILLIAM D. CARLSON
Acting Associate Administrator
Office of Grants and Program Systems



JOHN PATRICK JORDAN
Acting Administrator
Office of Grants and Program Systems

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This publication was prepared by the Grants Administrative Management Staff, Office of Grants and Program Systems, Science and Education, USDA.

Copies available from the Publication Requests and Distribution Section, Information Staff, Extension Service, U.S. Department of Agriculture, Washington, D.C. 20250.

FOOD AND AGRICULTURE COMPETITIVELY AWARDED RESEARCH AND EDUCATION GRANTS

Fiscal Year 1985

THE GRANTS PROGRAMS

The research grants programs of science and education under which the competitive selection process was used during Fiscal Year 1985 were:

1. Competitive Research Grants Program to support basic research in the food and agricultural sciences;

2. Special Research Grants Program to support research deemed by Congress and the Department of Agriculture to be of particular importance to the Nation;

3. Forest and Rangeland Renewable Resources Program to support basic research in the areas of harvesting, wood utilization and forest biology.

These sources of funding supplement and complement funding of Federal agricultural research and the basic State research institution formula funding by Congress to help maintain a viable, effective, ongoing State-Federal agricultural research capability for this country.

In addition, grants were awarded competitively for the following programs:

4. Rangeland Research Grants Program to support basic research in certain areas of rangeland research.

5. Small Business Innovation Research Program, a primary aim of which is to stimulate technological innovation in the private sector.

Renewals were also awarded for second year support of fellows selected competitively last year under the Food and Agricultural Sciences National Needs Graduate Fellowships Grants Program which is helping develop professional and scientific expertise in the food and agricultural sciences.

Grant funds for all of the above programs are administered through the Office of Grants and Program Systems.

Guidelines for grants to be awarded competitively are published annually in the Federal Register, usually near the end of each calendar year. The guidelines identify selected research areas, the amount of funding, and requirements for the submission of proposals.

Single copies or annual or semiannual subscriptions for the Federal Register are available for a small charge from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

If you want further information on programmatic aspects of these grants, contact:

Dr. William D. Carlson
Acting Associate Administrator
Office of Grants and Program Systems
U.S. Department of Agriculture
14th and Independence Avenue, S.W.
Washington, D.C. 20250

If you want information on administrative aspects of these grants, contact:

Mr. Terry J. Pacovsky
Chief
Grants Administrative Management
Office of Grants and Program Systems
U.S. Department of Agriculture
15th and Independence Avenue, S.W.
Washington, D.C. 20251

The following are listings of awards by Program areas for Fiscal Year 1985. Please note that some of these awards are renewals/amendments to existing projects and are identifiable by agreement periods starting prior to 10/1/84.

COMPETITIVE RESEARCH GRANTS PROGRAM

The following tabulation lists the funds awarded in the various areas in Fiscal Year 1985 under the Competitive Research Grants Program.

| | |
|---|--------------|
| Plant Biology | \$14,161,544 |
| Biological Nitrogen Fixation | \$3,060,000 |
| Biological Stress on Plants | 4,181,544 |
| Genetic Mechanisms for Crop Improvement | 3,860,000 |
| Photosynthesis | 3,060,000 |
| Human Requirements for Nutrients | \$ 1,920,600 |
| Biotechnology | \$19,206,000 |
| Animal Molecular Biology | 4,381,000 |
| Plant Molecular Biology | 4,100,000 |
| Animal Growth and Development | 3,400,000 |
| Plant Growth and Development | 2,225,000 |
| Response to Environmental Stress | 2,000,000 |
| Response to Biological Stress | 3,100,000 |
| Animal Science | \$4,321,350 |
| Insect Pest Science | \$2,880,900 |
| Acid Precipitation | \$ 667,409 |
| Alcohol Fuels Research | \$ 518,562 |
| Soybean Research | \$ 497,435 |
| TOTAL | \$44,173,800 |

This program is administered under the authority of Section 2(b) of P.L. 89-106, 7 U.S.C. 450i(b), as amended by Section 1414(b) of P.L. 95-113 and Section 1415(a) of P.L. 97-98, and in accordance with Sections 6301-6308 of P.L. 97-258. Section 1419 of P.L. 95-113, as amended, authorized grants for the Alcohol Fuels Research Program.

U.S. colleges and universities, other research institutions, Federal agencies, private organizations or corporations, and individuals may submit proposals.

PLANT BIOLOGY

Grants were awarded in four areas of research in plant biology: Biological nitrogen fixation, biological stress on plants, genetic mechanisms for crop improvement, and photosynthesis. A brief description of each area of research follow with a listing of research grants made during Fiscal Year 1985.

Biological Nitrogen Fixation

Grants in this area support research to find ways to naturally increase the nitrogen available to plants. Lack of nitrogen for plant growth is the most common limiting factor in crop agriculture. This research will contribute to understanding nitrogen-fixing mechanisms in both symbiotic and free-living organisms, as well as the fate of fixed nitrogen.

The objective of this research is to build a foundation of basic information concerning nitrogen fixation. This information should help us enhance the process in currently known systems and provide a base for developing new nitrogen-fixing associations--by genetic transfer or other means--for crop species not now posing such capability.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL NITROGEN FIXATION

5

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Univ. of California Berkeley, CA 94720 | John B. Neilands | \$50,000 | 09/01/85 | 08/31/86 | Iron Assimilation in Symbiotic Nitrogen Fixing Microorganisms |
| Univ. of California Davis, CA 95616 | Donald A. Phillips | \$100,000 | 09/01/83 | 08/31/87 | Host Legume Effects on Hydrogen Evolution by <u>Rhizobium</u> |
| Univ. of California Davis, CA 95616 | John C. Meeks | \$95,000 | 08/01/83 | 07/31/87 | Regulation of Growth and Heterocyst Differentiation in Symbiotic Cyanobacteria |
| Univ. of California Davis, CA 95616 | John L. Ingraham | \$60,000 | 07/01/84 | 06/30/86 | Physiological Denitrification: A Route to Conserving Fixed Nitrogen |
| Univ. of California Irvine, CA 92717 | Barbara K. Burgess | \$70,000 | 08/01/85 | 07/31/86 | Substrate Reactions in Nitrogenase |
| Univ. of Southern California Los Angeles, CA 90089 | Robert Bau | \$70,000 | 07/01/85 | 06/30/87 | Crystallographic Studies on the Iron-Molybdenum Co-Factor of Nitrogenase |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT PERIOD FROM TO | | TITLE |
|---|---------------------------|----------|-----------------------------|----------|--|
| Univ. of California Santa Cruz, CA 95064 | Robert Ludwig | \$80,000 | 07/01/85 | 06/30/87 | Mechanisms of Rhizobium ORS 571 N ₂ Fixation |
| Univ. of Connecticut Storrs, CT 06268 | David R. Benson | \$85,000 | 07/01/85 | 06/30/87 | Symbiotic Interactions in the <u>Frankia</u> Symbiosis |
| Univ. of Hawaii at Manoa Honolulu, HI 96822 | B. Ben Bohlool | \$80,000 | 07/01/85 | 06/30/87 | Host Control of Nodule Formation and Development in Soybean/ <u>Rhizobium</u> N ₂ Fixing Symbiosis |
| Univ. of Chicago Chicago, IL 60637 | Robert Haselkorn | \$70,000 | 07/01/85 | 06/30/86 | Rearrangement of Nitrogen Fixation Genes in Cyanobacterial Heterocyst Differentiation |
| Univ of Chicago Chicago, IL 60637 | Robert Haselkorn | \$70,000 | 08/01/84 | 07/31/86 | Nitrogen Fixation in Blue-green Algae (Cyanobacteria) |
| Agricultural Research Service, USDA 1815 N. University Street Peoria, IL 61604 | James E. Harper | \$33,000 | 09/01/85 | 08/31/87 | Interaction of Nitrate Metabolism with Nodulation of Soybean |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL NITROGEN FIXATION

7

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Purdue Res. Fdn. West Lafayette, IN 47907 | J. T. Bolin | \$105,000 | 08/01/83 | 07/31/87 | Three-dimensional Structure of Nitrogenase |
| Univ of Massachusetts Amherst, MA 01003 | Steven J. Robinson | \$80,000 | 07/01/85 | 06/30/87 | Transcription of a Second Copy of the Gene for Nitrogenase Reductase in <u>Anabaena</u> |
| Northeastern Univ. Boston, MA 02115 | Kostia Bergman | \$65,000 | 08/01/83 | 07/31/86 | Motility and Chemotaxis in <u>Rhizobium meliloti</u> |
| Massachusetts Inst. of Technology Cambridge, MA 02139 | W. Orme-Johnson | \$75,000 | 06/15/84 | 06/30/86 | Biochemical and Genetic Approaches to Structure and Function of MoFe Cofactor |
| Harvard College Cambridge, MA 02138 | John G. Torrey | \$89,734 | 08/01/83 | 07/31/87 | Sporulation by <u>Frankia</u> Related to Nodulation and <u>N₂</u> Fixation |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Michigan State Univ. East Lansing, MI 48824 | Barry K. Chelm | \$55,000 | 08/15/85 | 03/31/86 | Developmental and Physiological Gene Regulation in the <u>Rhizobium/Legume Symbiosis</u> |
| Michigan State Univ. East Lansing, MI 48824 | John L. Wang | \$43,000 | 09/01/83 | 08/31/86 | Lectin Receptors and Cytoskeletal Proteins in Soybean Cells |
| Michigan State Univ. East Lansing, MI 48824 | Frank B. Dazzo | \$125,000 | 07/01/85 | 06/30/87 | Clover Root Hair Responses to <u>Rhizobium trifolii</u> and its Biologically Active Polysaccharides |
| Michigan Tech. Univ. Houghton, MI 49931 | Wilbur H. Campbell | \$45,000 | 08/01/85 | 07/31/86 | Regulation of Corn Nitrate Reductase: Application of Monoclonal Antibodies |
| Agricultural Research Service, USDA 220 2nd Street South, 1st Floor Minneapolis, MN 55401 | Carroll P. Vance | \$90,000 | 08/01/83 | 06/30/87 | Regulation of Plant-Bacterial Interactions During Legume Root Nodule Formation |
| Univ. of Minnesota St. Paul, MN 55104 | Edmund P. Day | \$85,000 | 08/01/83 | 07/31/87 | Magnetic Susceptibility Studies of Nitrogenase |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL NITROGEN FIXATION

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GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|---|
| Univ. of Missouri Columbia, MO 65211 | David W. Emerich | \$110,000 | 09/01/85 | 08/31/87 | Symbiotic Nitrogen Fixation: The Role of Organic Acids |
| Univ. of Missouri Columbia, MO 65211 | Dale G. Blevins | \$130,000 | 08/01/85 | 07/31/87 | Ureide Metabolism in Nodulated Soybeans |
| Univ. of Missouri Columbia, MO 65211 | Judy D. Wall | \$45,000 | 09/15/84 | 09/30/86 | Nitrogen Metabolism and Nitrogen Fixation of <u>Rhodopseudomonas</u> <u>capsulata</u> |
| Washington Univ. St. Louis, MO 63130 | Daniel H. Kohl | \$100,000 | 08/01/85 | 07/31/87 | Natural Abundance of ^{15}N to Indicate Pathways of Fixed N in Nodules |
| Univ. of Nebraska Lincoln, NE 68588 | T. Adrian George | \$85,000 | 07/01/85 | 06/30/87 | Dinitrogen Complexes of Iron and Molybdenum with Sulfur Ligands |
| Boyce Thompson Inst. for Plant Res. Tower Road Ithaca, NY 14853 | Thomas A. LaRue | \$19,000 | 08/01/83 | 07/31/86 | Host Plant Genetics and Nodule Formation |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|----------|-------------------|--------------|---|
| Battelle Memorial Institute 505 King Avenue Columbus, OH 43201 | G. A. Peters | \$70,000 | 09/15/84 | 09/30/86 | The <u>Azolla Anabaena</u> Symbioses: Form and Function |
| Battelle Memorial Institute 505 King Avenue Columbus, OH 43201 | T. V. Bhuvaneswari | \$75,000 | 08/01/83 | 08/31/87 | Analysis of the Natural Population of <u>R. japonicum</u> as Competitors and Symbionts |
| Battelle Memorial Institute 505 King Avenue Columbus, OH 43201 | John W. McDonald | \$90,000 | 09/01/85 | 08/31/87 | Chemical and Spectroscopic Probes of the Metal Sites of Nitrogenase |
| Oregon State Univ. Corvallis, OR 97331 | Lyle R. Brown | \$45,000 | 09/01/83 | 08/31/86 | Molecular Mechanisms Controlling Nif and Sym Genes: A Role for RNA Polymerase |
| Oregon State Univ. Corvallis, OR 97331 | Peter J. Bottomley | \$60,000 | 08/01/85 | 07/31/86 | Factors Influencing Competition between Members of Indigenous Populations of <u>R. trifolii</u> |
| Univ. of Tennessee Knoxville, TN 37966 | Beth C. Mullin | \$30,266 | 08/01/85 | 07/31/86 | Organization and Expression of Leghemoglobin-like Sequences in <u>Alnus Glutinosa</u> |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Univ. of Texas at Austin Austin, TX 78712 | Fred R. Tabita | \$110,000 | 08/01/83 | 07/31/87 | Recovery of Nitrogenase from Oxygen Inactivation |
| Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061 | Dennis R. Dean | \$90,000 | 09/01/85 | 08/31/87 | Organization and Expression of Structural Genes for Nitrogenase from <u>Azotobacter Vinelandii</u> |
| Univ. of Wisconsin Madison, WI 53706 | Paul W. Ludden | \$105,000 | 09/01/85 | 08/31/87 | Non-genetic Regulation of Nitrogenase in Photosynthetic Bacteria |
| Univ. of Wisconsin Madison, WI 53706 | Eldon H. Newcomb | \$95,000 | 07/01/85 | 06/30/87 | Structure and Function in Bean Root Nodules Induced by Mutant Rhizobia |
| Marquette Univ. Milwaukee, WI 53233 | Kenneth D. Noel | \$80,000 | 07/01/85 | 06/30/87 | Rhizobium Genes for Root Nodule Development |

TOTAL \$3,060,000

Biological Stress on Plants

Research grants in this area support studies on stresses on plants arising from their interactions with other plants or with other biological agents such as weeds, insects, nematodes, fungi, bacteria, viruses and mycoplasma-like organisms. The ultimate goal is to reduce losses in plant productivity from damage caused by biologically generated stresses.

Emphasis in this area is on studies that will enhance understanding of how stressful interactions are established between plants and other biological agents; how such interactions are influenced by environmental and other factors inherent to the interacting organisms; how the interactions reduce plant productivity and usefulness to man; how plants react to stress generated by such interactions; and how damage from such interactions may be reduced or eliminated.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

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GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Univ. of Arkansas Fayetteville, AR 72701 | Rose Gergerich | \$119,000 | 07/01/85 | 06/30/87 | Ribonuclease in Beetle Regurgitant as a Determinant in Plant Virus Transmission |
| Univ. of Arkansas Fayetteville, AR 72701 | Seth Y. Young | \$70,000 | 09/15/83 | 09/30/87 | Baculovirus Transmission in <u>Anticarsia gemmatalis</u> Populations on Soybean |
| Northern Arizona Univ. Flagstaff, AZ 86011 | Thomas Whitham | \$40,000 | 07/15/84 | 07/31/86 | The Interaction of Environmental Stress and Herbivory on Pinyon Pine, <u>Pinus edulis</u> |
| Univ. of Arizona Tucson, AZ 85721 | Michael McClure | \$50,000 | 07/01/84 | 06/30/86 | Isolation and Characterization of Stylet Exudates from Root-Knot Nematodes |
| Univ. of California Davis, CA 95616 | John M. Duniway | \$50,000 | 07/01/85 | 06/30/86 | Influence of Environmental Stresses on the Development and Impact of Phytophthora Root Rot |
| Univ. of California Davis, CA 95616 | William Timberlake | \$50,000 | 09/01/84 | 08/31/86 | Development of Molecular Cloning Vectors for Filamentous Fungi |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|----------|-------------------|--------------|---|
| Univ. of California Davis, CA 95616 | Sean S. Duffey | \$50,000 | 08/01/84 | 07/31/86 | Biochemical Facets of Antibiosis of Tomatoes Against Noctuid Larvae |
| Univ. of California Davis, CA 95616 | George Bruening | \$50,000 | 09/15/84 | 09/30/86 | Antiviral Action of Satellite RNA |
| Univ. of California Riverside, CA 92521 | Edward Platzer | \$50,000 | 09/01/85 | 08/31/86 | Molecular Diagnostics of Plant Parasitic Nematodes |
| The Salk Inst. for Biological Studies P.O. Box 85800 San Diego, CA 92138 | Christopher Lamb | \$50,000 | 09/15/84 | 09/30/86 | Molecular Biology of the Phytoalexin Defense Response |
| Univ. of California Santa Cruz, CA 95064 | L. R. Fox | \$90,000 | 06/01/85 | 05/31/87 | Fertilizer-Community Interactions Affecting <u>Brassica</u> Productivity |
| Univ. of Delaware Newark, DE 19711 | Thomas K. Wood | \$90,000 | 08/01/85 | 07/31/87 | Insect Phenology Mediated by Host Plant Water Relations |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|----------|-------------------|--------------|---|
| Univ. of Florida Gainesville, FL 32611 | Michael J. Davis | \$70,000 | 07/01/85 | 06/30/87 | Host-Pathogen Interactions in Ratoon Stunting Disease of Sugarcane |
| Univ. of Florida Gainesville, FL 32611 | Simon S. J. Yu | \$70,000 | 07/15/85 | 07/31/87 | Detoxication of Allelochemicals by Herbivorous Insects |
| Agricultural Research Service, USDA P.O. Box 70, RR #2 Ames, IA 50010 | Karl J. Kramer | \$90,000 | 09/15/85 | 09/30/88 | Insect Control by Manipulation of Cuticle Destabilizing Enzymes |
| Iowa State Univ. of Science & Technology Ames, IA 50011 | Larry P. Pedigo | \$50,000 | 06/01/83 | 05/31/87 | Plant and Strand Response to Early Season Insect-induced Stresses |
| Loyola Univ. of Chicago Chicago, IL 60611 | S. K. Farrand | \$50,000 | 09/01/84 | 08/31/86 | Crown Gall Control: Plasmid Engineering to Maximize Control and Minimize Failures |
| Univ. of Illinois Urbana, IL 61801 | Gilbert Waldbauer | \$90,000 | 06/01/83 | 08/31/87 | Corn Earworm: Self Selection of Nutrient Balance on Natural and Defined Diets |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Purdue Res. Fdn. West Lafayette, IN 47907 | Avtar K. Handa | \$85,000 | 07/01/85 | 06/30/87 | Molecular Cloning of Pathogenicity Genes of <u>Erwinia</u> <u>carotovora</u> |
| Purdue Res. Fdn. West Lafayette, IN 47907 | David N. Kuhn | \$45,000 | 07/01/83 | 12/31/86 | Genes for Gene Theory and the Role of Recognition in Soybean Disease Resistance |
| Purdue Res. Fdn. West Lafayette, IN 47907 | Larry L. Murdock | \$100,000 | 09/01/85 | 08/31/87 | Central Nervous Control of Insect Feeding Behavior |
| Univ. of Kentucky Lexington, KY 40546 | M. R. Siegel | \$75,000 | 06/01/85 | 05/31/87 | Endophytic Fungi: Harmful and Beneficial Effects on Forage and Turf Grasses |
| Univ. of Kentucky Lexington, KY 40506 | David A. Smith | \$85,000 | 09/15/83 | 09/30/87 | Phytoalexin Detoxification as a Determining Characteristic of Fungal Virulence |
| Univ. of Kentucky Res. Fdn. Lexington, KY 40506 | John G. Shaw | \$45,000 | 07/01/85 | 06/30/86 | Viral Gene Expression in Potyvirus Infections |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

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GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|----------|-------------------|--------------|--|
| Univ. of Kentucky Res. Fdn. Lexington, KY 40536 | R. E. Rhoads | \$85,000 | 07/01/85 | 06/30/87 | Characterization of dsRNA in Hypovirulent Strains of <u>Endothia</u> <u>parasitica</u> |
| Univ. of Kentucky Res. Fdn. Lexington, KY 40506 | Juan G. Rodriguez | \$80,000 | 08/01/83 | 07/31/87 | Quantification of Plant Stress and Soybeans by Spider Mites |
| Univ. of Kentucky Res. Fdn. Lexington, KY 40506 | T. P. Pirone | \$50,000 | 05/15/83 | 05/31/86 | Nature and Mode of Action of the Potyvirus Helper Component |
| Louisiana State Univ. & A&M College Baton Rouge, LA 70803 | Ding S. Shih | \$85,000 | 08/01/85 | 07/31/87 | Plant Viral Protein Processing Enzymes and Specific Inhibitors |
| Univ. of Massachusetts Amherst, MA 01003 | Ronald Prokopy | \$91,000 | 09/15/85 | 09/30/87 | Host-finding Dynamics of Apple Maggot Flies |
| Harvard College Cambridge, MA 02138 | Arthur Ayers | \$80,000 | 07/01/85 | 06/30/87 | Plant Recognition of Pathogen Components (Elicitor) |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|----------|-------------------|--------------|---|
| Univ. of Maine at Orono Orono, ME 04469 | Stellos Tavantzis | \$50,000 | 07/01/84 | 06/30/86 | Biological Control by Transmissible Hypovirulence in <u>Rhizoctonia solani</u> |
| Michigan State Univ. East Lansing, MI 48824 | James Miller | \$50,000 | 06/01/83 | 05/31/86 | Quantifying Sensory Determinants Mediating Oviposition by the Onion Fly |
| Michigan State Univ. East Lansing, MI 48824 | R. Hammerschmidt | \$80,000 | 06/01/85 | 05/31/87 | Regulation and Localization of Induced Resistance in <u>Cucumis</u> |
| Agricultural Research Service, USDA 220 2nd Street South, 1st Floor Minneapolis, MN 55401 | Alan P. Roelfs | \$45,000 | 07/01/85 | 06/30/86 | Genetic Diversity in Sexual and Asexual Populations of Rust Fungi in Agroecosystems |
| Agricultural Research Service, USDA 220 2nd Street South, 1st Floor Minneapolis, MN 55401 | William Bushnell | \$80,000 | 09/15/85 | 09/30/87 | Locating Race-specific Incompatibility Events in Powdery Mildew of Barley |
| Washington Univ. St. Louis, MO 63130 | Joseph Varner | \$65,000 | 07/01/83 | 06/30/87 | The Role of Hydroxyproline-rich Glycoproteins in Plant Response to Stress |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

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GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|----------|-------------------|--------------|--|
| North Carolina State Univ. Raleigh, NC 27695 | Richard Roe | \$80,000 | 09/01/85 | 08/31/87 | Regulation of Juvenile Hormone Esterase -- New Biodegradable Insecticides |
| North Carolina State Univ. Raleigh, NC 27695 | George Kennedy | \$50,000 | 07/01/85 | 06/30/86 | Mechanisms of Multiple Insect Resistance in Wild Tomato Species |
| North Carolina State Univ. Raleigh, NC 27695 | Jeng-sheng Huang | \$90,000 | 07/01/85 | 06/30/87 | Iron Metabolism in Relation to Nematode -suppressed Nodule Development in Soybean |
| Agric. Expt. Station Univ. of Nebraska Lincoln, NE 68583 | J. M. Daly | \$50,000 | 07/01/85 | 06/30/86 | Identification of Host Resistance or Susceptibility to Toxins |
| Univ. of Nevada Reno, NV 89557 | Gary Blomquist | \$50,000 | 07/01/85 | 06/30/86 | Biosynthesis of Insect Hydrocarbons - Potential for Insect Control |
| Boyce Thompson Inst. for Plant Research Tower Road Ithaca, NY 14853 | V. Macko | \$77,982 | 09/01/85 | 08/31/87 | Characterization of Receptor Sites of Host-Selective Toxins from <u>Helminthosporium victoriae</u> |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|----------|-------------------|--------------|--|
| Boyce Thompson Inst. for Plant Research Tower Road Ithaca, NY 14853 | Patrick Hughes | \$40,000 | 09/01/84 | 08/31/86 | Quantitation of Viral Pesticide Infectivity and Pathogenicity |
| Cornell Univ. Ithaca, NY 14853 | James R. Aist | \$70,000 | 09/01/85 | 08/31/87 | Calcium Regulation in Secretion and Disease Resistance |
| Cornell Univ. Ithaca, NY 14853 | O. C. Yoder | \$70,000 | 09/15/84 | 09/30/87 | Utility of Cochliobolus of Plasmids for Vector Construction |
| Ohio State Univ. Res. Fdn. Columbus, OH 43212 | Lawrence Madden | \$75,000 | 09/01/85 | 03/31/87 | Rain Splash Dispersal of <u>Phytophthora cactorum</u> |
| Ohio State Univ. Columbus, OH 43212 | Lowell Nault | \$50,000 | 06/15/84 | 06/30/86 | Evolution of Leafhoppers and Stunting Pathogens with Maize and its Ancestors |
| Oklahoma State Univ. Stillwater, OK 74078 | Richard Johnson | \$90,000 | 06/01/83 | 05/31/87 | Wheat Adaptations for Greenbug Resistance under Drought |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Oregon State Univ. Corvallis, OR 97331 | Steven Radosevich | \$65,800 | 09/15/85 | 08/31/87 | Competition between Douglas-fir and Red Alder Seedlings: Resource Use, Physiology and Growth Analysis |
| Texas A&M Res. Fdn. College Station, TX 77843 | H. Williams | \$100,000 | 08/01/85 | 07/31/87 | Influence of Variable Plant Chemistry on Parasitoid Attraction and Learning |
| Utah State Univ. Logan, UT 84322 | Neal Van Alfen | \$75,000 | 07/01/85 | 06/30/87 | The Role of Bacterial EPS as a Virulence Factor in a Wilt Disease |
| Utah State Univ. Logan, UT 84322 | Edith B. Allen | \$90,000 | 06/01/83 | 05/31/87 | Interactions of VA Mycorrhizae and Weeds: Mechanisms for Reduced Stress on Rangeland Grasses |
| Agric. Expt. Station Utah State Univ. Logan, UT 84322 | Anne J. Anderson | \$50,000 | 09/15/84 | 09/30/86 | The Role of the Plant in Biological Control of Fungal Pathogens |
| Univ. of Virginia Charlottesville, VA 22903 | James Riopel | \$32,762 | 08/15/84 | 08/31/86 | Host/Parasite Interactions in Parasitic Angiosperms |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Univ. of Washington Seattle, WA 98195 | Eugene Nester | \$50,000 | 08/01/84 | 07/31/86 | Organization and Regulation of <u>Vir</u> Genes of <u>Agrobacterium</u> |
| Univ. of Wisconsin Madison, WI 53706 | Arthur Kelman | \$95,000 | 08/01/83 | 07/31/87 | Resistance of Potato Tubers to Tissue Maceration by Pectolytic Enzymes |
| Univ. of Wisconsin Madison, WI 53706 | Douglas Rouse | \$95,000 | 07/15/85 | 07/31/87 | Spatial Patterns of Brown Spot of Snap Beans and of <u>Pseudomonas</u> <u>syringae</u> |
| Univ. of Wisconsin Madison, WI 53706 | Nelson E. Balke | \$90,000 | 07/01/85 | 06/30/88 | Glucosylation as a Mechanism for Detoxication of Allelopathic Chemicals by Plants |
| Univ. of Wisconsin Madison, WI 53706 | M. T. Stephen Hsia | \$100,000 | 07/01/85 | 06/30/87 | Phytochemical and Toxicological Aspects of Foodplant Specialization in Lepidoptera |
| Univ. of Wisconsin Milwaukee, WI 53201 | Kenneth Nealson | \$90,000 | 09/01/85 | 08/31/87 | Physiological Studies of Insect Pathogenic Bacteria in the Genus <u>Xenohabdus</u> |

TOTAL \$4,181,544

Genetic Mechanisms for Crop Improvement

Grants in this area are to encourage innovative or unique genetic approaches to the development of genetically superior varieties of agricultural crops. They are directed toward obtaining novel genetic combinations or gene modifications that cannot be achieved using conventional plant breeding techniques. Research areas are: acquisitions of basic information on the plant nuclear and organellar genes; development of cellular and molecular methods for identifying plant genes or traits which are important targets for genetic manipulation; development of molecular and cellular methods for crop improvement using gene transfer or genetic engineering technology; cell and tissue culture studies designed to increase our knowledge of the basic processes involved in regenerating whole plants from single cells; development of new methods for producing, selecting, and transferring agronomically important traits; and basic genetic studies on the alteration and utilization of unadapted and wild germplasm.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Univ. of California Davis, CA 95616 | Richard Michelmore | \$174,000 | 07/01/85 | 06/30/88 | Variation in Lettuce Downy Mildew |
| Univ. of California Davis, CA 95616 | Calvin Qualset | \$85,250 | 06/01/85 | 05/31/87 | Transfer of a Gene for Barley Yellow Dwarf Virus Resistance from Barley to Wheat |
| Univ. of California, San Diego La Jolla, CA 92093 | Stephen Howell | \$150,000 | 06/15/85 | 05/31/87 | Complementation of Modified CaMV Genomes |
| Univ. of California Los Angeles, CA 90024 | C. Fred Fox | \$5,000 | 04/01/85 | 06/30/85 | Research Conference on Plant Genetics |
| Univ. of California Los Angeles, CA 90024 | George G. Laties | \$83,000 | 09/15/83 | 09/30/87 | Ethylene and Wounding Directed Gene Expression in Plant Tissues |
| Zoecon Corporation 975 California Avenue Palo Alto, CA 94304 | Donald Weeks | \$10,000 | 07/01/85 | 12/31/85 | Research Conference on the Genetics and Molecular Biology of Chlamydomonas |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Univ. of California Riverside, CA 92521 | Eugene Nothnagel | \$94,000 | 07/01/85 | 06/30/87 | Plasma Membrane-Cytoskeleton Interactions in Fused Plant Protoplasts |
| Yale Univ. New Haven, CT 06520 | Ian M. Sussex | \$171,000 | 05/15/85 | 05/31/87 | Stage-specific Gene Expression in the Shoot Apex in Relation to Flowering |
| Carnegie Institution of Washington 1530 P. Street, N.W. Washington, D.C. 20005 | William Thompson | \$82,000 | 09/15/85 | 09/30/86 | Isolation and Characterization of Genes Regulated by Light |
| Univ. of Florida Gainesville, FL 32611 | R. L. Smith | \$76,000 | 07/01/85 | 06/30/87 | Organelle DNA Organization and Cytoplasmic Male Sterility in <u>Pennisetum</u> |
| Univ. of Florida Gainesville, FL 32611 | Prem S. Chourey | \$90,500 | 07/01/85 | 06/30/87 | Molecular Analysis of Genomic Variability in Tissue Cultured Cells of Maize and Sorghum |
| Florida State Univ. Tallahassee, FL 32306 | George W. Bates | \$101,400 | 07/15/83 | 07/31/87 | Interspecific Gene Transfer by Fusin of Irradiated Plant Protoplasts |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|------------------------|-----------|----------------|-----------|--|
| Agricultural Research Service, USDA P.O. Box 5677 Athens, GA 30613 | Charles Stuber | \$56,000 | 09/15/83 | 09/30/86 | Isozyme Loci as Markers for Locating and Manipulating Quantitative Trait Loci |
| Univ. of Georgia Res. Fdn. Athens, GA 30602 | Wayne W. Hanna | \$145,000 | 09/15/85 | 09/30/88 | Interspecific Transfer of Genes for Obligate Apomixis from Wild <u>Pennisetum</u> to Pearl Millet |
| Univ. of Illinois Urbana, IL 61801 | Theodore Hymowitz | \$140,000 | 08/15/85 | 08/31/88 | The genus <u>Glycine</u> subgenus <u>Glycine</u> : Broadening the Genetic Base of Soybeans |
| Agricultural Research Services, USDA P.O. Box 70, RR #2 Ames, IA 50011 | Arnel R. Hallauer | \$99,100 | 06/01/85 | 05/31/90 | Selection Methods for Germplasm Enhancement in Corn |
| Kansas State Univ. Manhattan, KS 66506 | Bikram Gill | \$81,000 | 07/01/85 | 06/30/87 | Genome Evolution in Polyploid Species: Cytogenetic Analysis of Wheat- <u>Elymus</u> Addition Lines |
| Kansas State Univ. Manhattan, KS 66506 | Rollin G. Sears | \$17,000 | 07/15/84 | 07/31/86 | Chromosomal Mapping of Genes Controlling Tissue Culture Response in Wheat |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|----------|-------------------|--------------|--|
| Kansas State Univ. Manhattan, KS 66506 | Lowell Johnson | \$64,000 | 09/15/85 | 09/30/87 | Transfer of Genetic Information into Alfalfa through Protoplast Fusion |
| Univ. of Kentucky Res. Fdn. Lexington, KY 40506 | Glenn Collins | \$78,500 | 07/01/85 | 06/30/87 | Wide Hybridization and Gene Transfer in <u>Trifolium</u> |
| Univ. of Kentucky Res. Fdn. Lexington, KY 40546 | N. L. Taylor | \$56,000 | 09/01/83 | 08/31/86 | Genetics and Breeding of Somaclonal Variation in Red Clover |
| Univ. of Maine Orono, ME 04469 | Robert Roxby | \$61,000 | 07/01/85 | 06/30/88 | Isolation and Characterization of Potato Tuberization Genes |
| Agricultural Research Service, USDA Room 227, Bldg. 003, BARC-West Beltsville, MD 20705 | Benjamin Matthews | \$55,000 | 09/15/85 | 09/30/87 | Cloning and Expression of Genes Involved in Amino Acid Biosynthesis |
| Univ. of Maryland Baltimore County 5401 Wilkens Avenue Catonsville, MD 21228 | Madeline C. Wu | \$37,000 | 09/01/85 | 08/31/86 | The Replication of Chloroplast DNA in <u>Chlamydomonas reinhardii</u> |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Harvard College Cambridge, MA 02138 | James Birchler | \$168,400 | 07/01/85 | 06/30/88 | Chromosomal Manipulation in Maize |
| Michigan State Univ. East Lansing, MI 48824 | C. Peter Wolk | \$80,000 | 07/01/85 | 06/30/87 | Further Mapping of the Chromosome of <u>Anabaena</u> by a Surrogate Genetic Approach |
| Agricultural Research Service, USDA 220 2nd Street South, 1st Floor Minneapolis, MN 55401 | Leonard Joppa | \$36,000 | 09/15/85 | 09/30/87 | The Effectiveness of Homoeologous Pairing Genes in <u>Triticum</u> <u>turgidum</u> , <u>T. aestivum</u> , and <u>T.</u> <u>speltoides</u> |
| Univ. of Minnesota St. Paul, MN 55104 | R. L. Phillips | \$76,000 | 08/01/85 | 07/31/87 | Tissue Culture Genetic Systems |
| Washington Univ. St. Louis, MO 63130 | John C. Rogers | \$178,000 | 08/01/85 | 07/31/88 | Regulation of Gene Expression in Barley Aleurone Cells |
| Univ. of Nebraska Lincoln, NE 68588 | Russel H. Meints | \$92,000 | 08/01/85 | 07/31/87 | Development of Transformation Vectors in <u>Chlorella</u> -like Green Alga |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT PERIOD FROM TO | TITLE |
|--|---------------------------|-----------|-----------------------------|--|
| Res. Fdn. of State Univ. of New York Albany, NY 12201 | Jeremy A. Bruenn | \$50,000 | 09/01/85 08/31/87 | Cloning and Expression of the <u>Ustilago maydis</u> Virus Toxin Gene |
| Cornell Univ. Ithaca, NY 14853 | J. B. Nasrallah | \$148,000 | 09/15/85 09/30/87 | Molecular Genetic Analysis of the <u>Brassica</u> S Locus |
| Cornell Univ. 123 Day Hall Ithaca, NY 14853 | Martha Mutschler | \$136,000 | 09/01/85 08/31/87 | Genetic Modification of Cytoplasmic Traits in <u>Brassica</u> Species |
| Cornell Univ. Ithaca, NY 14853 | Steven Tanksley | \$65,000 | 09/01/85 08/31/87 | Further Development of Protein- specific Genetic Markers in Tomato |
| North Carolina State Univ. Raleigh, NC 27650 | Harold Stalker | \$30,000 | 09/01/83 08/31/86 | Biosystematics and Utilization of <u>Arachis</u> Species to Improve Cultivated Peanuts |
| Ohio State Univ. Res. Fdn. Columbus, OH 43212 | George Marzluf | \$70,000 | 06/01/85 05/31/87 | Genetic Transformation and Direct Cloning in <u>Neurospora</u> |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Pennsylvania State Univ. University Park, PA 16802 | Charles D. Boyer | \$40,000 | 09/01/85 | 03/31/87 | Mutant Expression in Maize Endosperm Suspension Cultures |
| Univ. of Rhode Island Kingston, RI 02881 | John Mottinger | \$120,000 | 08/01/83 | 07/31/87 | Studies on Mutations Associated with Virus Infection in Maize |
| Texas A&M Res. Fdn. College Station, TX 77843 | William D. Park | \$78,000 | 09/15/83 | 09/30/86 | Regulation of Tuber Protein Synthesis in Potato |
| Texas A&M Res. Fdn. College Station, TX 77843 | Hugh D. Wilson | \$56,000 | 09/15/83 | 09/30/86 | Genetic Structure of Weed-Crop Population Systems (<u>Cucurbita</u> and <u>Chenopodium</u>) |
| Virginia Polytech Inst. & State Univ. Blacksburg, VA 24061 | Richard Veilleux | \$80,850 | 09/01/85 | 08/31/87 | Use of Monoploid Genotypes in Cell Cultures and Breeding Strategies for Potato |
| Washington State Univ. Pullman, WA 99164 | Michael Thomashow | \$50,000 | 08/01/83 | 07/31/86 | Characterization of <u>Nicotiana-pTiAg63</u> Related DNA Sequences |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

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GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Univ. of Wisconsin Madison, WI 53706 | Peter H. Quail | \$125,000 | 09/01/85 | 08/31/86 | The Phytochrome Gene: Structure, Organization and Expression |
| Univ. of Wisconsin Madison, WI 53706 | Richard Vierstra | \$169,000 | 07/01/85 | 06/30/88 | Biochemical and Molecular Characterization of Plant Ubiquitin |

TOTAL \$3,860,000

Photosynthesis

Grants in this area focus on a better understanding of photosynthesis and associated carbon metabolism. Photosynthesis is the process that crop plants use to convert solar energy into food products that plants and animals use for growth and development.

The program's aim is to cover such areas as the mechanisms of energy capture and conversion, structure, synthesis, and turnover of the photosynthetic apparatus, CO₂ fixation, photorespiration, and dark respiration. Other areas included in this program are projects on the relation of plant development to photosynthesis, including development of photosynthetic competence, translocation and partitioning of photosynthetic products; and design of whole leaf and whole plant structures best suited for photosynthetic productivity. Another area set forth for proposals is the design of new methods of genetic and cellular manipulation to improve photosynthetic efficiency in plants--including studies of the chloroplast genome, of nuclear genes regulating photosynthesis, and analysis of regulatory steps controlling both nuclear and cytoplasmic genome expression and their interactions.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

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GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|---|
| Univ. of California Berkeley, CA 94720 | Anastasios Melis | \$80,000 | 09/01/85 | 08/31/87 | Structural Differentiation and Functional Organization in Higher Plant Chloroplasts |
| Univ. of California Davis, CA 95616 | Mark Matthews | \$75,000 | 09/01/85 | 08/31/87 | Physiological Mechanisms of Photosynthetic Acclimation to Water Deficits |
| Univ. of California Davis, CA 95616 | Robert Pearcy | \$70,000 | 07/01/85 | 06/30/87 | Dynamic Responses of Photosynthesis to Variable Light |
| San Francisco Operations Office U. S. Department of Energy Oakland, CA 94612 | Kenneth Sauer | \$120,000 | 09/01/85 | 08/31/87 | Electron Spin Echo Spectroscopy in Photosynthesis |
| Univ. of Denver (Colorado Seminary) University Park Denver, CO 80208 | Steven Berg | \$70,000 | 06/01/85 | 05/31/87 | The Use of Polyclonal Antibodies to Study the Topology of Three Thylakoid Protein Complexes |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|---|
| Agricultural Research Service, USDA 2625 Redwing Road Ft. Collins, CO 80526 | Roger Wyse | \$45,000 | 09/01/84 | 03/31/86 | Control Mechanisms for Photosynthate Partitioning in Sugarbeet |
| Univ. of Miami Coral Gables, FL 33124 | Roger E. Fenna | \$25,678 | 09/01/85 | 08/31/86 | Structural Studies of Chlorophyll-Protein Complexes |
| Agricultural Research Service, USDA P.O. Box 5677 Athens, GA 30613 | Steven Huber | \$80,000 | 06/01/85 | 05/31/87 | Mechanisms for Control of Photosynthetic Sucrose Formation |
| Iowa State Univ. of Science & Technology Ames, IA 50011 | Martin Spalding | \$75,000 | 08/15/85 | 08/31/87 | <u>Chlamydomonas</u> Mutants Defective in the CO ₂ -concentrating Pathway |
| Univ. of Chicago Chicago, IL 60637 | Robert Haselkorn | \$111,972 | 07/01/85 | 06/30/87 | Molecular Genetic Analysis of the Photosynthetic Apparatus in Cyanobacteria |
| Univ. of Chicago Chicago, IL 60637 | Gayle Lampa | \$75,000 | 07/01/85 | 06/30/87 | Molecular Basis of the Selective Transport of Proteins into Chloroplasts |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Univ. of Health Sciences The Chicago Medical School 3333 Green Bay Rd. North Chicago, IL 60064 | Frank Marcus | \$115,000 | 09/01/83 | 08/31/87 | Light Regulated Enzymes of Photosynthetic Carbon Assimilation |
| Kansas State Univ. Manhattan, KS 66506 | James Guikema | \$28,925 | 09/15/83 | 09/30/86 | Development of Lipid-Protein Complexes in <u>Anacystis</u> Membranes |
| Kansas State Univ. Manhattan, KS 66506 | James Guikema | \$33,925 | 09/15/83 | 09/30/87 | Development of Lipid-Protein Complexes in <u>Anacystis</u> Membranes |
| Harvard College Cambridge, MA 02138 | Lawrence Bogorad | \$60,000 | 09/01/85 | 08/31/86 | Genes for Photosynthesis in Corn |
| Univ. of Michigan Ann Arbor, MI 48109 | R. R. Scharp | \$90,000 | 09/01/83 | 08/31/87 | Amino Acids at the Active Site of CF ₁ , a Spin-echo nmr Study |
| Michigan State Univ. East Lansing, MI 48824 | C. Somerville | \$64,500 | 07/15/83 | 07/31/86 | Directed Genetic Modification of RuBP Carboxylase/Oxygenase |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Washington Univ. St. Louis, MO 63130 | Dewey Holten | \$100,000 | 09/01/85 | 08/31/87 | Ultrafast Spectroscopic Studies of Photosynthetic Electron Transfer |
| Agric. Expt. Station Univ. of Nebraska Lincoln, NE 68583 | Raymond Chollet | \$90,000 | 09/01/85 | 08/31/87 | Regulation of Pyruvate, Pi Dikinase Activity |
| Agric. Expt. Station Univ. of Nebraska Lincoln, NE 68588 | Robert Spreitzer | \$75,000 | 06/15/85 | 05/31/87 | Genetic Modification of RuBP Carboxylase/Oxygenase in <u>Chlamydomonas reinhardtii</u> |
| Rutgers, The State Univ. New Brunswick, NJ 08903 | Barbara Zilinskas | \$85,000 | 06/01/85 | 05/31/87 | Structure and Function of Cyanobacterial Photosynthetic Systems |
| Rutgers, The State Univ. New Brunswick, NJ 08903 | Carl A. Price | \$75,000 | 07/01/85 | 06/30/87 | Translational Regulation in Chloroplasts |
| Cornell Univ. Ithaca, NY 14853 | Richard McCarty | \$110,000 | 09/01/83 | 08/31/87 | The Glycolate Transporter of the Chloroplast Envelope |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Cornell Univ. Ithaca, NY 14853 | Andre Jagendorf | \$55,000 | 09/15/85 | 09/30/86 | Chloroplast Proteins: Synthesis, Degradation and Controls |
| The Rockefeller Univ. New York, NY 10021 | Anthony Cashmore | \$120,000 | 08/01/83 | 07/31/87 | Characterization of Plant Genes Encoding Photosynthetic Membrane Proteins |
| Rensselaer Polytechnic Inst. Troy, NY 12180 | John Salerno | \$80,000 | 07/01/85 | 06/30/87 | Electron Transfer and Energy Conservation in Chloroplasts |
| Brookhaven National Laboratory U.S. Department of Energy Upton, NY 11973 | John Bennett | \$90,000 | 09/01/85 | 08/31/87 | Biosynthesis, Structure and Assembly of the Reaction Center of Photosystem 2 |
| Brookhaven National Laboratory U. S. Department of Energy Upton, NY 11973 | G. Hind | \$80,000 | 09/01/85 | 08/31/87 | Photosynthetic Mechanisms in Nitrogen-fixing Heterocysts of Cyanobacteria |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|----------|-------------------|--------------|--|
| Brookhaven National Laboratory U.S. Department of Energy Upton, NY 11973 | John Bennett | \$55,000 | 09/01/84 | 08/31/86 | Chloroplast Protein Kinases and the Regulation of Photosynthesis |
| Pennsylvania State Univ. University Park, PA 16802 | S. Stevens, Jr. | \$60,000 | 09/01/85 | 12/31/86 | Directed Mutagenesis of the Ribulose Bisphosphate Carboxylase Small Subunit |
| Pennsylvania State Univ. University Park, PA 16802 | J. Shannon | \$90,000 | 09/01/85 | 08/31/87 | Mechanism(s) of Assimilate Absorption into the Endosperm of <u>Zea mays</u> L. Kernels |
| Gordon Research Conferences c/o Univ. of Rhode Island Gordon Research Ctr. Kingston, RI 02881 | Gerald Babcock | \$5,000 | 07/01/85 | 03/31/86 | Gordon Research Conference on Physicochemical Aspects of Photosynthesis |
| Brown Univ. Providence, RI 02912 | John Biggins | \$90,000 | 09/01/85 | 08/31/87 | Regulation of Excitation Energy Distribution in the Phycobilin - Chlorophyll Systems |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Brown Univ. Providence, RI 02912 | John Biggins | \$10,000 | 09/01/85 | 08/31/87 | Partial Support of the VII International Congress on Photosynthesis |
| Univ. of South Carolina Columbia, SC 29208 | Anthony Huang | \$90,000 | 08/01/83 | 07/31/87 | Metabolic Control in Peroxisomes and Mitochondria in Photorespiration |
| Univ. of Texas at Austin Austin, TX 78712 | F. Robert Tabita | \$110,000 | 09/01/83 | 08/31/87 | Bacterial Genes Coding for Plant Ribulose Bisphosphate Carboxylase/Oxygenase |
| Texas Tech Univ. Lubbock, TX 79409 | David Knaff | \$60,000 | 09/01/85 | 08/31/86 | Protein Complexes in Photosynthetic Electron Transfer Reactions |
| Texas Tech Univ. Lubbock, TX 79409 | Allan S. Holaday | \$75,000 | 06/01/85 | 05/31/87 | Controls on the Development of C ₄ Photosynthesis in C ₃ x C ₄ <u>Flaveria</u> F ₁ Hybrids |
| Univ. of Wisconsin Madison, WI 53706 | Marion O'Leary | \$115,000 | 09/01/83 | 08/31/87 | Mechanism of Action of Phosphoenolpyruvate Carboxylase |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT PERIOD FROM TO | TITLE |
|--|---------------------------|-----------|-----------------------------|---|
| Univ. of Wisconsin Madison, WI 53706 | John Markley | \$120,000 | 09/01/85 08/31/87 | Mechanisms of Electron Transport in Photosynthesis |

TOTAL \$3,060,000

HUMAN REQUIREMENT FOR NUTRIENTS

The emphasis in this program area is on determining human requirements for nutrients. Support is not provided for clinical research or for demonstration or action projects.

Research in human nutrition contributes to improving human nutritional status by increasing our understanding of requirements for nutrients in relation to different patterns of food intake. Findings help fill the gaps of our knowledge related to nutrient requirements, bioavailability, the interrelationships of nutrients, and the nutritional value of foods consumed in the United States as they relate to these requirements. Special attention in this program area is given to the study of trace constituents of foods and their effect on human health.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|----------|-------------------|--------------|--|
| Univ. of Arizona Tucson, AZ 85721 | Roger A. Sunde | \$50,000 | 07/01/85 | 06/30/86 | Selenomethionine Metabolism and Utilization |
| Agricultural Research Service, USDA 800 Buchanan Street Albany, CA 94710 | Judith R. Turnlund | \$70,000 | 09/15/85 | 09/30/86 | Use of Stable Isotopes to Determine Dietary Requirements of Zn, Cu, Fe, Ca, and Mg |
| Univ. of California Berkeley, CA 94720 | Janet C. King | \$40,000 | 08/01/85 | 07/31/86 | Dietary Induced Thermogenesis in the Obese Pregnant Woman |
| Univ. of California Davis, CA 95616 | Bo Lonnerdal | \$60,000 | 09/01/85 | 08/31/86 | Manganese Absorption in Humans |
| Univ. of California Los Angeles, CA 90024 | Isabelle F. Hunt | \$75,000 | 09/01/83 | 08/31/86 | Diet and Bone Mineral Density in Women Aged 50-79 Years |
| Colorado State Univ. Ft. Collins, CO 80523 | Gustav R. Jansen | \$70,000 | 09/01/85 | 08/31/86 | Mechanisms by which Dietary Protein and Amino Acids Control Lactation |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: HUMAN NUTRITION

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GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Georgetown Univ. Washington, D.C. 20057 | Margit Hamosh | \$36,000 | 09/15/85 | 09/30/86 | Milk Lipases in Delivery and Digestion of Fat in Infants: An Animal Model |
| George Washington Univ. Washington, D.C. 20052 | George V. Vahouny | \$100,000 | 08/01/85 | 07/31/87 | Dietary Fibers and Intestinal Function: Structure-Function Correlations |
| Fort Wayne State Hospital & Training Center Ft. Wayne, IN 46815 | Stephen P. Coburn | \$100,000 | 09/15/85 | 09/30/88 | Quantitative Assessment of Vitamin B ₆ Metabolism in Man with Stable Isotopes |
| Purdue Res. Fdn. West Lafayette, IN 47907 | Robert DiSilvestro | \$55,600 | 09/01/85 | 08/31/87 | Evaluation of Current and Newly Proposed Methods of Copper Status Assessment |
| Purdue Res. Fdn. West Lafayette, IN 47907 | S. Suzanne Nielsen | \$110,000 | 09/15/85 | 09/30/87 | Resistance of Legume Proteins to Proteolysis |
| Purdue Res. Fdn. West Lafayette, IN 47907 | Jon A. Story | \$70,000 | 09/01/83 | 08/31/86 | Mechanisms of Alteration of Bile Acid Excretion by Dietary Fiber |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Boston Univ. Boston, MA 02215 | Steven H. Zeisel | \$50,000 | 09/01/85 | 08/31/87 | Is Choline an Essential Nutrient for Humans? |
| Massachusetts General Hospital Boston, MA 02114 | Susan S. Baker | \$45,000 | 08/01/85 | 07/31/86 | Effect of Malnutrition on Barrier Function of Gastrointestinal Microvillus Membrane |
| Massachusetts Inst. of Technology Cambridge, MA 02139 | Vernon R. Young | \$100,000 | 09/15/84 | 09/30/86 | A Novel Approach for Study of Human Amino Acid Metabolism and Dietary Requirements |
| Massachusetts Inst. of Technology Cambridge, MA 02139 | George Wolf | \$90,000 | 09/01/85 | 08/31/87 | Biochemical Reasons for the Requirement of Vitamin A in the Mammalian Organism |
| Johns Hopkins Univ. Baltimore, MD 21218 | Tomas R. Guilarte | \$36,000 | 09/01/85 | 08/31/86 | Maternal Vitamin B-6 Nutrition: Effects on the Dopaminergic System of Progeny |
| Univ. of Missouri Columbia, MO 65211 | Calvin W. Woodruff | \$65,000 | 08/15/84 | 08/31/86 | Vitamin A Requirements of Preterm Infants |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT PERIOD FROM TO | TITLE |
|---|---------------------------|----------|-----------------------------|--|
| Cornell Univ. Ithaca, NY 14853 | Steven D. Mercurio | \$55,000 | 09/01/85 08/31/87 | Influences of Dietary Mercaptans on the Biological Function of Selenium |
| Cornell Univ. Ithaca, NY 14853 | John E. Kinsella | \$80,000 | 07/15/82 09/30/86 | Antithrombotic Action of n3 Polyunsaturated Acids: Optimum Intake and Effects on Prostaglandins |
| St. Luke's-Roosevelt Inst. for Health Science 114th St. & Amsterdam Ave. New York, NY 10025 | F. X. Pi-Sunyer | \$60,000 | 07/01/85 06/30/86 | Chromium Absorption and Assessment |
| Duke Univ. Durham, NC 27706 | Jean L. Johnson | \$68,000 | 07/01/85 06/30/86 | Role of Molybdenum and the Molybdenum Cofactor in Human Health and Nutrition |
| Oklahoma State Univ. Stillwater, OK 74078 | Eldon C. Nelson | \$90,000 | 08/15/85 08/31/87 | Metabolism of Retinoids |
| Univ of Texas at Austin Austin, TX 78712 | J. Freeland-Graves | \$35,000 | 07/15/84 07/31/86 | Manganese: Assessment of Requirements and Functions |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Univ. of Vermont & State Agric. College Burlington, VT 05405 | Elliot Danforth | \$80,000 | 08/01/83 | 07/31/86 | Diet-induced Alterations in Thyroid Hormone Metabolism and Nutritional Requirements |
| Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061 | Mark L. Failla | \$60,000 | 09/01/85 | 08/31/86 | Influence of Obesity on Zinc and Iron Metabolism |
| Virginia Commonwealth Univ. Richmond, VA 23298 | Gregory S. Head | \$70,000 | 09/01/85 | 08/31/87 | Bioavailability and Requirements of Biotin for infants and Children |
| Univ. of Wisconsin Madison, WI 53706 | Frank R. Greer | \$100,000 | 09/01/85 | 08/31/87 | The Vitamin D Requirements of Breast-fed Infants in the United States |

TOTAL \$1,920,600

BIOTECHNOLOGY

It is widely acknowledged that biotechnological research offers direct access to new, potentially valuable high technology opportunities for agriculture and food production. Recent discoveries in molecular genetics and their successful applications show that "high technology in biology" is applicable to agriculture and food and they contribute significantly to "the molecular revolution" that is basic to many of our industries. The new biotechnological research capabilities -- particularly those that build on advances in molecular biology -- have particular advantages for agriculture. They provide a new basis for changing plant and animal productivity and performance on the basis of the directed modification of specified genes and gene systems.

This new capability offers exceptional promise, but it cannot be effective unless it is closely integrated with basic science disciplines such as biochemistry, physiology, taxonomy, ecology and key agriculture disciplines such as plant and animal breeding, agronomy, horticulture, plant pathology, and entomology. In recognizing these needs, the overall goal of the Biotechnology Program is to support research aimed at establishing a thorough understanding of fundamental biological processes in animals, plants and associated microorganisms that may provide the basic scientific knowledge needed for the development and application of the new biotechnological research capability to agriculture and food.

Three research areas are emphasized: (1) molecular biology, (2) molecular and cellular mechanisms of growth and development, and (3) genetic and molecular mechanisms controlling responses to environmental and biological stress.

In Fiscal Year 1985, six review panels were assembled to evaluate proposals submitted to the Biotechnology Program. The grants awarded in this program are listed below by review panel.

Biotechnology-Plant Molecular Biology

The primary objective of the sub-area, plant molecular biology, is to increase our understanding of the structure, function, regulation, and expression of genes of plant and the associated microbial systems. This program area emphasizes the following categories of research: (1) identification, isolation, and characterization of genes and gene products, (2) relationships between gene structure and function, (3) regulatory mechanisms of gene expression, (4) interactions between nuclear and organellar genes, and between extrachromosomal and chromosomal genes, (5) mechanisms of gene recombination and transposition, (6) molecular basis of chromosomal replication, and (7) mechanisms of interaction with beneficial or deleterious microorganisms.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT MOLECULAR BIOLOGY

49

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|---|
| Univ. of California Berkeley, CA 94720 | Andrew O. Jackson | \$240,000 | 09/01/85 | 08/31/87 | Structure, Pathology, and Genetics of Barley Stripe Mosaic Virus |
| Univ. of California, San Diego La Jolla, CA 92093 | Stephen H. Howell | \$120,000 | 09/01/85 | 08/31/87 | Stability of DNA Introduced into Plants |
| Univ. of California Los Angeles, CA 90024 | R. B. Goldberg | \$240,000 | 08/15/85 | 08/30/87 | Regulatory Sequences Controlling Viral-induced Gene Expression in Tobacco |
| Stanford Univ. Stanford, CA 94305 | Virginia Walbot | \$170,000 | 09/15/85 | 09/30/87 | Expression of Maize Mitochondrial Genome |
| Colorado State Univ. Ft. Collins, CO 80523 | Craig C. Schenck | \$124,731 | 09/15/85 | 09/30/87 | Structure-Function Relationships in Chlorophyll Binding Proteins |
| Carnegie Institution of Washington 1530 P Street, N.W. Washington, D.C. 20005 | William Thompson | \$100,000 | 09/15/85 | 09/30/87 | Photoregulated Gene Expression in Chloroplasts |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Univ. of Florida Gainesville, FL 32611 | Daryl R. Pring | \$100,000 | 09/01/85 | 08/31/87 | Cosmid Mapping of Mitochondrial DNA of Male Fertile and Male Sterile Sorghum |
| International Society for Plant Molecular Biology Athens, GA 30602 | Leon Dure, III | \$7,500* | 09/01/85 | 02/28/86 | First International Congress of Plant Molecular Biology |
| Univ. of Georgia Res. Fdn. Athens, GA 30602 | Richard Meagher | \$170,000 | 09/15/85 | 09/30/87 | Expression of Soybean Nuclear Genes in Transgenic Plants |
| Univ. of Illinois Urbana, IL 61801 | S. Kaplan | \$200,000 | 09/15/85 | 09/30/87 | Synthetic Deoxyoligonucleotide - Directed Analysis of Gene Control in Photosynthesis |
| Univ. of Illinois Urbana, IL 61801 | Mary A. Schuler | \$190,000 | 09/01/85 | 08/31/87 | Plant Cytochromes P-450: Regulation of Gene Expression |
| Univ. of Kentucky Res. Fdn. Lexington, KY 40506 | Arthur G. Hunt | \$140,000 | 09/01/85 | 08/31/87 | Gene Expression in Plants: A Characterization of Plant Polyadenylation Signals |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT MOLECULAR BIOLOGY

51

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|---|
| Univ. of Kentucky Res. Fdn. Lexington, KY 40506 | Robert J. Shepherd | \$100,000 | 09/01/85 | 08/31/87 | Complementation Among Caulimoviruses |
| Univ. of Michigan Ann Arbor, MI 48109 | Jeffrey D. Palmer | \$100,000 | 09/15/85 | 09/30/87 | Repeated DNA Sequences and Chloroplast DNA Instability in Clover |
| Univ. of Minnesota St. Paul, MN 55104 | Carolyn D. Silflow | \$190,000 | 09/15/85 | 09/30/87 | Tubulin Genes in Higher Plants |
| Washington State Univ. St. Louis, MO 63130 | Ursula Goodenough | \$150,000 | 09/15/85 | 09/30/87 | Hydroxyproline-Rich Glycoproteins: Sequences, Interactions, and Evolution |
| Agricultural Research Service, USDA P.O. Box 225, Stoneville Road Stoneville, MS 38776 | Kenneth C. Ehrlich | \$100,000 | 09/15/85 | 09/30/87 | Plant Proteins Involved in Regulating Gene Expression through DNA Methylation |
| Univ. of New Hampshire Durham, NH 03824 | Anita S. Klein | \$140,000 | 09/15/85 | 09/30/87 | Tissue-specific Gene Regulation in Maize |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Univ. of North Carolina Chapel Hill, NC 27514 | Ann G. Matthysse | \$100,000 | 09/15/85 | 09/30/87 | Characterization and Use of Agrobacterium Genes for Attachment to Plant Cells |
| Rutgers, The State Univ. New Brunswick, NJ 08903 | Daniel F. Klessig | \$110,000 | 09/15/85 | 09/30/87 | Regulation of Pathogenesis- related Proteins Synthesis in <u>Nicotiana</u> |
| Cold Spring Harbor Laboratory P.O. Box 100 Cold Sprg. Harbor, NY 11724 | Stephen Dellaporta | \$124,000 | 09/01/85 | 08/31/87 | Changes in <u>Waxy</u> Gene Activity by Excision of a <u>DS</u> Element |
| Cornell Univ. Ithaca, NY 14853 | O. C. Yoder | \$140,000 | 09/01/85 | 08/31/87 | Transposable Elements in Filamentous Fungi |
| Cornell Univ. Ithaca, NY 14853 | Maureen R. Hanson | \$114,000 | 09/01/85 | 08/31/87 | Regulation of Mitochondrial Gene Expression |
| Univ. of Oregon Eugene, OR 97403 | William Siström | \$50,269 | 09/15/85 | 09/30/87 | Structure-Function-Relations in Chlorophyll Binding Proteins |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT MOLECULAR BIOLOGY

53

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Texas A&M Res. Fdn. P.O. Box 3578 College Station, TX 77843 | William D. Park | \$190,000 | 09/01/85 | 08/31/87 | Cis-Acting Factors Regulating the Expression of Patatin Genes of Potato |
| Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061 | Dennis R. Dean | \$188,000 | 09/15/85 | 09/30/87 | Genetic and Biochemical Analysis of the <u>nifEN</u> Genes and their Products from <u>Azotobacter</u> |
| Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061 | Kriton K. Hatzios | \$70,000 | 09/15/85 | 09/30/87 | Molecular Biology of the Enhanced Degradation of Thiocarbamate Herbicides by Soil Microorganisms |
| Washington State Univ. Pullman, WA 99164 | Gynheung An | \$145,000 | 09/01/85 | 08/31/87 | Introduction of Useful Traits into Crop Plants by Genetic Engineering |
| Univ. of Washington Seattle, WA 98195 | Arnold J. Bendich | \$46,500 | 09/15/85 | 09/30/86 | Genetic Transformation for Plant Mitochondrial Genes |
| Univ. of Wisconsin Madison, WI 53706 | William Reznikoff | \$110,000 | 09/01/85 | 08/31/87 | Promoters Controlled by Anaerobiosis |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT PERIOD FROM TO | TITLE |
|--|---------------------------|-----------|-----------------------------|---------------------------------|
| Univ. of Wisconsin Madison, WI 53706 | Richard A. Spritz | \$130,000 | 09/15/85 09/30/87 | RNA Processing of Higher Plants |

TOTAL \$4,100,000

* Total award amount of \$10,000 was split-funded with
Response to Biological Stress contributing the
remaining \$2,500.

Biotechnology-Animal Molecular Biology

The basic objective of this sub-program area is to increase our knowledge and understanding of the structure, function, regulation and expression of animal, viral and microbial genomes. These include research in the broad areas of virology, immunogenetics, bacteriology, parasitology, genetics, infectious disease, endocrinology, gene transfer and germline integration of exogenous genes, and molecular biology of genes of cellular or animal origin. The priorities are given to those studies that will yield fundamental information which may ultimately aid in improving the biological efficiency and disease resistance in domestic animals.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Auburn Univ. Auburn University, AL 36849 | Rex A. Dunham | \$61,500 | 09/15/85 | 09/30/87 | Gene Transfer and Expression in Catfish via Gynogenesis |
| Stanford Univ. Stanford, CA 94305 | Gary K. Schoolnik | \$238,600 | 08/15/85 | 08/31/87 | <u>Moraxella bovis</u> pili. Molecular and Genetic Studies |
| Colorado State Univ. Ft. Collins, CO 80523 | B. J. Beaty | \$100,000 | 09/15/85 | 09/30/87 | Transposition of Genes into Mosquito Genomes to Control Vector Potential |
| Colorado State Univ. Ft. Collins, CO 80523 | Ralph E. Smith | \$100,000 | 09/15/85 | 09/30/87 | Molecular Cloning of Avian Leukosis Viruses |
| Univ. of Florida Gainesville, FL 32611 | Guy H. Palmer | \$126,000 | 09/15/85 | 09/30/87 | Development of a Bovine Leukemia Virus Subunit Vaccine |
| Univ. of Georgia Res. Fdn. Athens, GA 30602 | Benjamin Brackett | \$150,000 | 09/01/85 | 08/31/87 | Use of Retroviral Promoters for Heterologous Gene Expression in Animals |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL MOLECULAR BIOLOGY

57

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|---|
| Iowa State Univ. of Science & Technology Ames, IA 50011 | Carol M. Warner | \$100,000 | 09/15/85 | 09/30/87 | Molecular Analysis of the Chicken Major Histocompatibility Complex |
| Agricultural Research Service, USDA P.O. BOX 70, RR #2 Ames, IA 50010 | Harley W. Moon | \$79,000 | 09/01/85 | 08/31/87 | Genetically Engineered Live Oral Pilus Vaccine for Postweaning <u>E.</u> <u>coli</u> Infection of Swine |
| Rush-Presbyterian- St. Luke's Medical Center Chicago, IL 60612 | Thomas Schnitzer | \$115,000 | 09/15/85 | 09/30/87 | Molecular Basis of Avian Reovirus Disease |
| Univ. of Illinois Chicago, IL 60680 | Katherine Knight | \$105,000 | 09/01/85 | 08/31/87 | Structure and Organization of Bovine Immunoglobulin Genes |
| Univ. of Illinois Urbana, IL 61801 | Deoki N. Tripathy | \$100,000 | 09/01/85 | 08/31/87 | Fowlpox Virus as a Cloning Vector for Poultry Pathogens |
| Louisiana State Univ. & A&M College Baton Rouge, LA 70803 | Ronald Montelaro | \$100,000 | 09/15/85 | 09/30/87 | EIAV Provirus: Structure, Expression, and Diagnostic Potential |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Amherst College Amherst, MA 01002 | Richard Goldsby | \$239,700 | 08/15/85 | 08/31/88 | Cloning Bovine Ig Genes and their Use to Construct Functional Chimeric Molecules |
| Agricultural Research Service, USDA Room 227, Bldg. 003, BARC-West Beltsville, MD 20705 | Joan K. Lunney | \$146,500 | 09/01/85 | 08/31/87 | Enhancement of Disease Resistance in Genetically Engineered Swine |
| Michigan State Univ. East Lansing, MI 48824 | Leland F. Velicer | \$102,000 | 09/15/85 | 09/30/87 | Marek's Disease Herpesvirus Molecular Biology: Secretory Glycoprotein Gene Analysis |
| Agricultural Research Service, USDA 220 2nd Street South, 1st Floor Minneapolis, MN 55401 | Larry D. Bacon | \$101,700 | 09/15/85 | 09/30/88 | Isolation and Analysis of Chicken MHC Class II Genes and Relation to Disease |
| Agricultural Research Service, USDA 220 2nd Street South, 1st Floor Minneapolis, MN 55401 | Lucy F. Lee | \$137,000 | 09/01/85 | 08/31/88 | Transforming Genes and Gene Products of Oncogenic Marek's Disease Virus |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL MOLECULAR BIOLOGY

59

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|------------------------|-----------|----------------|-----------|--|
| Agricultural Research Service, USDA 220 2nd Street South, 1st Floor Minneapolis, MN 55401 | Lyman Crittenden | \$90,000 | 09/01/85 | 08/31/87 | Gene Transfer to the Germline of Chicken Using Retroviral Vectors |
| Agricultural Research Service, USDA 220 2nd Street South, 1st Floor Minneapolis, MN 55401 | Robert F. Silva | \$70,500 | 09/01/85 | 08/31/87 | Bioengineering Avian Herpesviruses to Construct Live Recombinant DNA Vaccines |
| Univ. of Missouri Columbia, MO 65211 | Kim S. Wise | \$140,000 | 09/01/85 | 08/31/87 | Immunologic and Molecular Genetic Determinants in Mycoplasmal Pneumonia of Swine |
| North Carolina State Univ. Raleigh, NC 27695 | Todd Klaenhammer | \$104,000 | 09/15/85 | 09/30/87 | Transfer, Expression, and Cloning of Phage Resistance Genes in Lactic Streptococci |
| North Carolina State Univ. Raleigh, NC 27695 | Walter Dobrogosz | \$126,400 | 09/01/85 | 08/31/87 | Plasmid Biology of <u>Lactobacillus plantarum</u> |
| Univ. of Nevada Reno, NV 89557 | Stuart T. Nichol | \$129,700 | 09/15/85 | 09/30/87 | A Molecular Approach to Vesicular Stomatitis Epizootiology, Disease and Control |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Cornell Univ. Ithaca, NY 14853 | Gary M. Dunny | \$100,000 | 09/15/85 | 09/30/87 | Bacteriophage Resistance in Dairy Streptococci |
| Columbia Univ. in the City of New York New York, NY 10027 | Martin Chalfie | \$102,000 | 09/01/85 | 08/31/87 | Genetic and Molecular Analysis of Drug Resistance in <u>Caenorhabditis elegans</u> |
| Univ. of Cincinnati Cincinnati, OH 45221 | Jeffrey Robbins | \$100,000 | 09/01/85 | 08/31/87 | Gene Regulation of the Major Muscle Protein, Myosin, in Domestic Poultry |
| Ohio State Univ. Res. Fdn. Columbus, OH 43212 | D. N. Foster | \$100,000 | 09/01/85 | 08/31/87 | Isolation and Structural Organization of the Chicken Gonadotrophic Genes |
| Agricultural Research Service, USDA 600 East Mermaid Lane Philadelphia, PA 19118 | Marvin Grubman | \$70,000 | 09/15/85 | 09/30/87 | Study of Foot-and-Mouth Disease Virus Assembly and Neutralizing Antigenic Determinants |
| Texas A&M Res. Fdn. College Station, TX 77843 | James Womack | \$147,000 | 09/01/85 | 08/31/87 | Molecular and Somatic Cell Genetics: Mapping the Cattle Genome |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL MOLECULAR BIOLOGY

61

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|---|
| Washington State Univ. Pullman, WA 99164 | Gary H. Thorgaard | \$100,000 | 09/15/85 | 09/30/87 | Gene Transfer in Fish by Sperm Chromosome Fragmentation and Gynogenesis |
| Washington State Univ. Pullman, WA 99164 | William Cheevers | \$144,000 | 09/01/85 | 08/31/87 | Structure, Organization and Expression of the CAE Virus Envelope Gene |
| Washington State Univ. Pullman, WA 99164 | T. Yilma | \$140,000 | 09/01/85 | 08/31/87 | A General Method for the Production of Polyvalent Vaccines in Vaccinia Virus Recombinants |
| Washington State Univ. Pullman, WA 99164 | Anthony Barbet | \$95,900 | 09/01/85 | 08/31/87 | Development of a Recombinant DNA Derived Vaccine against Bovine Anaplasmosis |
| Washington State Univ. Pullman, WA 99164 | Raymond Reeves | \$100,000 | 08/15/85 | 08/30/87 | Cloning of Cellular Genes Responsive to Infection and Transformation by BLV |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Children's Orthopedic Hospital & Medical Center 4800 Sand Point Way, NE Seattle, WA 98105 | Stephen Moseley | \$134,500 | 09/01/85 | 08/31/87 | Genetic Organization and Function in the Production of the F41 Bacterial Adhesin |
| Univ. of Wisconsin Madison, WI 53706 | Gary Splitter | \$140,000 | 09/15/85 | 09/30/87 | Characterization of the Bovine Major Histocompatibility Complex |
| Univ. of Wisconsin Madison, WI 53706 | Richard Marsh | \$145,000 | 09/01/85 | 08/31/87 | Characterization of Scrapie Agent Nucleic Acid |

TOTAL \$4,381,000

Biotechnology-Animal Growth and Development

Research in animal growth and development contributes to a basic understanding of potential problems related to suboptimal growth and development in animals of agricultural significance. This sub-program area emphasizes research designed to fill gaps in knowledge in a number of areas including mammary gland biogenesis and development, growth hormones and growth factors which regulate muscle and skeleton growth, the transfer of exogenous genes to the germline of domestic animals and their subsegment expression, the role of hormones and other factors in mediating immunologic stress, and developmental consequences of embryo transfers. Special attention is given to innovative projects of "high risk".

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Univ. of Arizona Tucson, AZ 85721 | Darrel E. Goll | \$150,000 | 09/15/85 | 09/30/87 | Proteases Responsible for Muscle Protein Degradation and Their Role in Growth |
| Univ. of California Davis, CA 95616 | Ransom Baldwin | \$185,000 | 09/15/85 | 09/30/87 | Quantitative Evaluation of Physiological and Metabolic Limits to Lactation |
| Univ. of California Davis, CA 95616 | Kirk C. Klasing | \$100,000 | 09/15/85 | 09/30/87 | Role and Mode of Action of Interleukin-1 in Mediating Immunologic Stress |
| Colorado State Univ. Ft. Collins, CO 80523 | Rupert P. Amann | \$101,300 | 09/15/85 | 09/30/87 | Control of Prepubertal Changes in Neuroendocrine Function in Bull Calves |
| Univ. of Connecticut Storrs, CT 06268 | Hans Laufer | \$100,000 | 09/01/85 | 08/31/87 | Control of Reproduction in Shrimp, Prawns and Crayfish |
| Univ. of Florida Gainesville, FL 32611 | Francis C. Davis | \$175,400 | 09/15/85 | 09/30/87 | Translational Regulation of mRNAs Synthesized During Oogenesis |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Iowa State Univ. of Science & Technology Ames, IA 50011 | C. M. Warner | \$143,400 | 09/15/85 | 09/30/87 | Role of the SLA Complex in Pig Development and Reproduction |
| Tufts Univ. Boston, MA 02111 | V. Papaioannou | \$122,000 | 09/15/85 | 09/30/87 | Development and Viability of Micromanipulated Preimplantation Pig Embryos |
| Johns Hopkins Univ. Baltimore, MD 21205 | John D. Gearhart | \$150,000 | 09/15/85 | 09/30/87 | Genetic and Developmental Consequences of Gene Transfer into Mouse Embryos |
| Univ. of Maryland College Park, MD 20742 | Ian H. Mather | \$90,700 | 09/01/85 | 08/31/89 | Distribution and Biogenesis of Mammary Membrane Proteins |
| North Carolina State Univ. Raleigh, NC 27695 | Ruth M. Shuman | \$150,000 | 09/15/85 | 09/30/87 | Gene Transfer and Tissue-specific Expression of Genes in Domestic Animals |
| Rutgers, The State Univ. Piscataway, NJ 08854 | Rocco V. Carsia | \$86,000 | 09/01/85 | 08/31/87 | Molecular Biology of Stress Response at the Adrenocortical Cell Level |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Health Research, Inc. Roswell Park Division & New York State Dept. of Health 666 Elm Street Buffalo, NY 14263 | Garth R. Anderson | \$153,900 | 09/15/85 | 09/30/87 | VL30 Sequences as Anoxic Stress Response Genes |
| Cornell Univ. Ithaca, NY 14853 | David B. Wilson | \$121,600 | 09/15/85 | 09/30/87 | Genetic Engineering of Acid Resistant, Cellulolytic, Rumen Bacteria |
| Cornell Univ. Ithaca, NY 14853 | Dale E. Bauman | \$185,000 | 09/01/85 | 08/31/87 | Cellular and Metabolic Mechanisms Controlling Efficiency of Growth and Lactation |
| Ohio Univ. Athens, OH 45701 | T. E. Wagner | \$150,000 | 09/15/85 | 09/30/87 | Mammary Specific, Germline, Genetic Delivery of a Lactogenic Growth Hormone(s) |
| The Wistar Institute 36th & Spruce Streets Philadelphia, PA 19104 | Davor Solter | \$150,000 | 09/15/85 | 09/30/87 | Cloning in Mammals by Nuclear Transfer |
| Pennsylvania State Univ. University Park, PA 16802 | Terry D. Etherton | \$100,000 | 09/15/85 | 09/30/87 | Regulation of Nutrient Utilization in Pigs by Porcine Growth Hormone |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Pennsylvania State Univ. University Park, PA 16802 | Craig Baumrucker | \$100,000 | 09/15/85 | 09/30/87 | IGF ₁ Stimulation of Bovine Mammary Tissue Growth |
| Pennsylvania State Univ. University Park, PA 16802 | Roy H. Hammerstedt | \$100,000 | 09/01/85 | 08/31/87 | Cryoprotection of Membranes |
| Pennsylvania State Univ. University Park, PA 16802 | Frederick Ferguson | \$100,000 | 09/15/85 | 09/30/87 | Swine Natural Killer Cells: Cloning and Production of Monoclonal Antibodies |
| Texas A&M Res. Fdn. College Station, TX 77843 | Thomas Welsh, Jr. | \$100,000 | 09/01/85 | 08/31/87 | Regulation of Corticotropin- releasing Factor (CRF) and Adrenocorticotropin (ACTH) |
| Univ. of Texas System Cancer Center M. D. Anderson Hospital and Tumor Institute Houston, TX 77030 | Marsha L. Frazier | \$150,000 | 09/15/85 | 09/30/87 | Genes Coding for Insulin Immunoreactivity in Fetal Bovine Pancreas Development |
| Washington State Univ. Pullman, WA 99164 | Lynette B. Corbeil | \$124,200 | 09/15/85 | 09/30/87 | Prevention of Stress Related Mastitis with Recombinant Bovine Interferon |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Washington State Univ. Pullman, WA 99164-5045 | Michael Griswold | \$150,000 | 09/15/85 | 09/30/87 | Bovine Testicular Transferrin |
| Univ. of Wisconsin Madison, WI 53706 | Neal L. First | \$161,500 | 09/15/85 | 09/30/87 | Ontogeny and Control of Development of Bovine Preimplantation Embryos |

TOTAL \$3,400,000

Biotechnology-Plant Growth and Development

The goal of this sub-program area is to support basic research designed to increase a fundamental understanding of the developmental processes in agriculturally important plants and plant associated microorganisms and to encourage the use of emerging techniques for the investigation of the developmental process that may contribute to the increased agricultural productivity. This program area places emphasis on; (1) cellular and molecular mechanisms controlling growth and developmental processes including reproduction, differentiation, and senescence, and (2) metabolic processes related to growth and development.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Univ. of California Berkeley, CA 94720 | Bob B. Buchanan | \$105,000 | 08/01/85 | 07/31/87 | Developmental Studies on Thioredoxin-linked Regulatory Mechanisms in C ₄ Plants |
| Univ. of California Berkeley, CA 94720 | William C. Taylor | \$83,000 | 09/15/85 | 09/30/87 | Chloroplast Development Influences Nuclear Gene Expression |
| Univ. of California Los Angeles, CA 90024 | E. M. Tobin | \$188,000 | 08/15/85 | 08/31/87 | Functional and Mutational Analysis of a Thylakoid Protein |
| Univ. of Florida Gainesville, FL 32611 | G. A. Moore | \$118,000 | 08/01/85 | 07/31/87 | Genetic Transformation of <u>Citrus</u> to Facilitate Hybrid Production |
| Agricultural Research Service, USDA P.O. Box 5677 Athens, GA 30613 | Carole L. Bassett | \$85,000 | 09/01/85 | 08/31/87 | Characterization of RNases Synthesized during Floral Development in Morning Glory |
| Univ. of Chicago Chicago, IL 60637 | Laurens J. Mets | \$114,000 | 08/01/85 | 07/31/87 | Genetic Control of Cellular Differentiation in Leaves of a C ₄ Dicot |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT GROWTH & DEVELOPMENT

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GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Univ. of Illinois Chicago, IL 60680 | C. W. Beecher | \$50,000 | 08/15/85 | 08/31/87 | Analysis of Secondary Metabolite Induction by NMR |
| Purdue Res. Fdn. West Lafayette, IN 47907 | Brian A. Larkins | \$130,000 | 09/01/85 | 08/31/87 | Analysis of Seed Globulin Genes and their Expression in Cereals |
| Agricultural Research Service, USDA Rm. 227, Bldg. 003, BARC-West Beltsville, MD 20705 | Jerry D. Cohen | \$83,000 | 08/01/85 | 07/31/87 | Characterization and Developmental Study of a Peptide Conjugate of IAA from <u>Phaseolus</u> |
| Michigan State Univ. East Lansing, MI 48824 | Jan A. D. Zeevaart | \$85,000 | 09/01/85 | 08/31/87 | Genetic Control of Gibberellin Metabolism in Relation to Development in Tomato |
| Univ. of Minnesota St. Paul, MN 55104 | Emily E. Hoover | \$50,000 | 09/01/85 | 08/31/87 | Regulation of Interspecific Seed Failure in <u>Phaseolus</u> |
| St. Mary's College Winona, MN 55987 | Richard V. Knowles | \$50,000 | 09/15/85 | 09/30/87 | DNA Amplification in <u>Zea mays</u> Endosperm: Control and Relationship to Development |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Washington Univ. St. Louis MO 63130 | Paul P-C. Lin | \$64,000 | 08/01/85 | 07/31/87 | Genetic/Molecular Biololgy and Regulation of Polyamine Metabolism |
| Washington Univ. St. Louis, MO 63130 | John C. Rogers | \$100,000 | 08/01/85 | 07/31/87 | Mechanisms Directing Hormonal and Developmental Regulation of Gene Expression in Barley |
| Montana State Univ. Bozeman, MT 59717 | Richard G. Stout | \$50,000 | 09/01/85 | 08/31/87 | Mode of Action of the Phytotoxin Fusicoccin: An Immunological Approach |
| Univ. of New Hampshire Durham, NH 03824 | Thomas D. Lee | \$67,000 | 08/15/85 | 08/31/87 | Fruit and Seed Abortion: Are they Related to Pollen Competition? |
| The Rockefeller Univ. New York, NY 10021 | Anthony Cashmore | \$175,000 | 08/01/85 | 07/31/87 | Genetic Manipulation of Protein Import into Plant Mitochondria |
| Oregon State Univ. Corvallis, OR 97331 | Carol J. Rivin | \$102,000 | 09/15/85 | 09/30/88 | Molecular Analysis of Embryo Development in Wild Type and <u>vp</u> Mutants of Maize |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT GROWTH & DEVELOPMENT

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GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Oregon State Univ. Corvallis, OR 97331 | Roy O. Morris | \$165,000 | 08/01/85 | 07/31/87 | Expression of Heterologous Cytokinin Biosynthetic Gene in Tobacco |
| Univ. of Oregon Eugene, OR 97403 | Donald R. Hague | \$103,000 | 09/01/85 | 08/31/87 | Regulation of Pyruvate, Pi Dikinase in Maize |
| Gordon Research Conferences c/o Univ. of Rhode Island Gordon Research Center Kingston, RI 02881 | Ronald L. Phillips | \$6,000 | 06/01/85 | 11/30/85 | Gordon Research Conference on Plant Cell and Tissue Culture |
| Texas A&M Res. Fdn. College Station, TX 77843 | Craig L. Nessler | \$85,000 | 07/15/85 | 07/31/87 | Cell Specific Gene Expression during Laticifer Differentiation in Poppy |
| Univ. of Vermont & State Agric. College Burlington, VT 05405 | Philip Lintilhac | \$50,000 | 09/01/85 | 08/31/87 | Developmental Patterning of Plant Callus Cultures with Mechanical Stimuli |
| Univ. of Washington Seattle, WA 98195 | E. Van Volkenburgh | \$67,000 | 09/15/85 | 09/30/87 | Genetic Limitation of Leaf Growth |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT PERIOD FROM TO | TITLE |
|--|---------------------------|----------|-----------------------------|--|
| Univ. of Wisconsin Madison, WI 53706 | Chong-maw Cheng | \$50,000 | 08/01/85 07/31/87 | Molecular Control of Cytokinins on Plant Growth |

TOTAL \$2,225,000

Biotechnology-Genetic and Molecular
Mechanisms Controlling Responses to
Environmental Stress in Plants

This program supports research on the various physico-chemical factors (such as heat, cold, drought, etc.) which prevent the expression of the full genetic potential of a plant. The major goals are to understand the molecular basis for the response to the various stresses and to identify which genetic systems causing these responses can be manipulated by biotechnology techniques.

The program emphasizes: the identification, transfer, and expression of genes involved in the stress response or are likely to affect performance under stress; fundamental mechanisms of the stress response including injury, tolerance and avoidance of stress at the molecular, cellular, and organismal level; mechanisms of the coordination of organismal response to stress; and laboratory and field investigations leading to an understanding of the causes, consequences, and avoidance of stress.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - RESPONSE TO ENVIRONMENTAL STRESS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Univ. of Arizona Tucson, AZ 85721 | Hans J. Bohnert | \$141,000 | 08/01/85 | 07/31/87 | Regulation of Gene Expression during CAM-Induction |
| Agricultural Research Service, USDA 800 Buchanan Street Albany, CA 94710 | William J. Hurkman | \$115,000 | 09/15/85 | 09/30/88 | Identification of Membrane Proteins Responsible for Salt Tolerance |
| Univ. of California Davis, CA 95616 | Carole P. Meredith | \$110,000 | 09/15/85 | 09/30/87 | Selection and Characterization of Mutants Resistant to Mineral Stress |
| Univ. of California Davis, CA 95616 | M. A. Matthews | \$144,000 | 08/01/85 | 07/31/87 | Physiological Mechanisms of Plant Growth Inhibition by Low Water Potentials |
| Univ. of Florida Gainesville, FL 32611 | Charles L. Guy | \$119,000 | 09/01/85 | 08/31/88 | Altered Gene Expression and Protein Synthesis in Spinach during Cold Acclimation |
| Iowa State Univ. Ames, IA 50011 | Cecil R. Stewart | \$101,000 | 08/01/85 | 07/31/87 | Hormonal, Molecular, and Cellular Aspects of Stress Induced Proline Accumulation in Plants |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - RESPONSE TO ENVIRONMENTAL STRESS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Purdue Res. Fdn. West Lafayette, IN 47907 | Paul Hasegawa | \$150,000 | 08/01/85 | 07/31/88 | Role of Ion Accumulation and Compartmentation in Salinity Adaptation of Cultured Cells |
| Purdue Res. Fdn. West Lafayette, IN 47907 | David Rhodes | \$110,000 | 08/01/85 | 07/31/87 | Metabolism of Proline Accumulation in Relation to Salinity Tolerance in Plants |
| Purdue Res. Fdn. West Lafayette, IN 47907 | Peter Goldsbrough | \$151,000 | 08/01/85 | 07/31/88 | Regulation of Protein Synthesis Induced by Cadmium in Plant Cell Cultures |
| Univ. of Massachusetts Amherst, MA 01003 | David L. Mulcahy | \$30,000 | 09/01/85 | 08/31/86 | Correlations Between Chilling Injuries in Soybean Sporophyte and Pollen |
| Michigan State Univ. East Lansing, MI 48824 | Paul K. Kindel | \$137,000 | 08/01/85 | 07/31/88 | Structure-activity Relationships of the Freeze-inhibitor Polysaccharides of Winter Rye and Barley |
| Univ. of Minnesota St. Paul, MN 55104 | John V. Carter | \$33,000 | 09/15/85 | 09/30/86 | Role of Microtubules in Freezing Injury and Cold Acclimation in Plants |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - RESPONSE TO ENVIRONMENTAL STRESS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|---|
| Univ. of Minnesota St. Paul, MN 55108 | Robert Brambl | \$154,000 | 09/15/85 | 09/30/88 | The Heat Shock (Stress) Response: Protein Function and Gene Regulation |
| Univ. of Nevada System on behalf of The Desert Research Institute P.O. Box 60220 Reno, NV 89506 | Jeffrey Seemann | \$89,000 | 09/01/85 | 08/31/87 | Stress Effects on the Functioning and Efficiency of CO ₂ Fixation |
| Cornell Univ. Ithaca, NY 14853 | Peter L. Steponkus | \$128,000 | 08/01/85 | 07/31/88 | Cold Acclimation and Freezing Injury: Role of Plasma Membrane Lipid Alterations |
| Texas A&M Res. Fdn. College Station, TX 77843 | John E. Mullet | \$153,000 | 08/01/85 | 07/31/88 | The Molecular Basis of Absciscic Acid Synthesis During Plant Water Stress |
| Univ. of Wisconsin Madison, WI 53706 | Jiwan P. Palta | \$135,000 | 09/01/85 | 08/31/87 | Mechanism of Freezing Stress Resistance and Cold Acclimation in Plants |

TOTAL \$2,000,000

Biotechnology-Plant Response to
Biological Stress

Grants in this area support studies on the genetic and molecular mechanisms controlling plant responses to other biological agents, such as insects, nematodes, fungi, bacteria, viruses, and mycoplasma-like organisms. A major goal of this sub-program area is to understand the molecular basis for the organism's interactions with these stress agents and to identify which genetic systems causing these responses can be manipulated by techniques in biotechnology.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT RESPONSE TO BIOLOGICAL STRESS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Univ. of Arizona Tucson, AZ 85721 | Alan J. Howarth | \$50,000 | 09/01/85 | 08/31/86 | Transcription and Gene Expression of a Geminivirus |
| Univ. of California Berkeley, CA 94720 | Loy E. Volkman | \$150,000 | 08/15/85 | 08/31/88 | AcNPV Structural Proteins |
| Univ. of California Berkeley, CA 94720 | T. J. Morris | \$100,000 | 09/01/85 | 08/31/87 | Molecular Structure and Function of the Carnation of Mottle Virus Genome |
| Univ. of California Davis, CA 95616 | Tsune Kosuge | \$66,000 | 07/01/85 | 06/30/86 | Control of Virulence in <u>Pseudomonas savastanoi</u> |
| Univ. of California Davis, CA 95616 | George Bruening | \$45,000 | 09/15/85 | 09/30/86 | Molecular Basis of Symptom Induction by Cauliflower Mosaic Virus |
| Univ. of California Riverside, CA 92521 | William O. Dawson | \$100,000 | 09/01/85 | 08/31/87 | Gene Expression of cDNA Clones of Tobacco Mosaic Virus |
| International Society for Plant Molecular Biology Athens, GA 30602 | Leon Dure, III | \$2,500* | 09/01/85 | 02/28/86 | First International Congress of Plant Molecular Biology |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT RESPONSE TO BIOLOGICAL STRESS

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GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Univ. of Hawaii at Manoa Honolulu, HI 96822 | John Leong | \$130,000 | 09/15/85 | 09/30/87 | Iron Uptake Genes of Plant Growth Promoting <u>Pseudomonas</u> |
| Univ. of Idaho Moscow, ID 83843 | Lois K. Miller | \$100,000 | 09/01/85 | 08/31/87 | Improving the Efficacy of Baculovirus Pesticides by Recombinant DNA Technology |
| Univ. of Illinois Urbana, IL 61801 | Judith H. Willis | \$75,000 | 09/01/85 | 08/31/87 | New Approaches for Obtaining Lepidopteran Epithelial Cell Lines |
| Purdue Res. Fdn. West Lafayette, IN 47907 | Peter E. Dunn | \$119,700 | 09/15/85 | 09/30/87 | Structure and Expression of Genes Encoding Insect Antibacterial Proteins |
| Kansas State Univ. Manhattan, KS 66506 | Steven A. Lommel | \$50,000 | 09/15/85 | 09/30/86 | Genetics, Replication and Pseudorecombination of the Dianthoviruses |
| Kansas State Univ. Manhattan, KS 66506 | Jan E. Leach | \$55,000 | 08/15/85 | 08/31/86 | Avirulence in the Rice/ <u>Xanthomonas Campestris</u> pv. <u>Oryzae</u> Interaction |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT RESPONSE TO BIOLOGICAL STRESS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|------------------------|-----------|----------------|-----------|--|
| Agricultural Research Service, USDA Room 227, Bldg. 003 BARC-West Beltsville, MD 20705 | Jacobus M. Kaper | \$130,000 | 09/15/85 | 09/30/87 | Cucumoviral Satellites: Structure - Biological Function |
| Agricultural Research Service, USDA Room 227, Bldg. 003 BARC-West Beltsville, MD 20705 | Robert A. Owens | \$120,000 | 08/15/85 | 08/31/88 | Mechanisms of Plant Viroid Replication and Viroid-host Interaction |
| Agricultural Research Service ARS, USDA Room 227, Bldg. 003, BARC-West Beltsville, MD 20705 | C. J. Baker | \$90,000 | 09/01/85 | 08/31/87 | The Molecular and Genetic Basis for Disease Resistance in Plants |
| Univ. of Maryland College Park, MD 20742 | Alan Collmer | \$100,000 | 09/15/85 | 09/30/87 | Mechanism of Pectate Lyase Excretion by <u>Erwinia chrysanthemi</u> |
| North Carolina State Univ. Raleigh, NC 27695 | William Dougherty | \$150,000 | 09/01/85 | 08/31/87 | Molecular Analysis of Potyvirus Capsid Protein; Role in Aphid Transmission |

COMPETITIVE RESEARCH GRANTS PROGRAM
 PROGRAM AREA: BIOTECHNOLOGY - PLANT RESPONSE TO BIOLOGICAL STRESS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Univ. of Medicine & Dentistry of New Jersey-School of Osteopathic Medicine 401 Haddon Ave. Camden, NJ 08103 | Ann M. Fallon | \$100,000 | 09/01/85 | 08/31/87 | Application of DNA-mediated Gene Transfer to Studies on Insecticide Resistance |
| Cornell Univ. Ithaca, NY 14853 | Milton Zaitlin | \$100,000 | 09/01/85 | 08/31/87 | Interactions of Plant Viruses with Their Hosts |
| The Rockefeller Univ. New York, NY 10021 | Hugh D. Robertson | \$120,000 | 08/15/85 | 08/31/87 | Viroid Multiplication and Disease Induction |
| Ohio State Univ. Res. Fdn. Columbus, OH 43212 | David L. Coplin | \$100,000 | 09/01/85 | 08/31/87 | Genes for Exopolysaccharide Biosynthesis and Virulence in <u>Erwinia stewartii</u> |
| Oregon State Univ. Corvallis, OR 97331 | Wallace I. Mills | \$120,000 | 09/01/85 | 08/31/87 | Isolation of <u>Pseudomonas</u> Gene Products that Cause Disease in <u>Phaseolus vulgaris</u> |
| Oregon State Univ. Corvallis, OR 97331 | George F. Rohrmann | \$100,000 | 09/01/85 | 08/31/87 | Identification and Characterization of Baculovirus Gene Translation Products |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT RESPONSE TO BIOLOGICAL STRESS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Univ. of Oregon Eugene, OR 97403 | John Poltlethwait | \$150,000 | 09/01/85 | 08/31/87 | Molecular Genetics of Immunity in Fruit Flies |
| Texas A&M Res. Fdn. College Station, TX 77843 | Max D. Summers | \$160,000 | 09/15/85 | 09/30/87 | Integration of <u>Campoplexis</u> sonorensis Virus DNA in Parasitoid Wasp Cellular DNA |
| Utah State Univ. Logan, UT 84322 | Anne J. Anderson | \$55,900 | 09/15/85 | 09/30/87 | Molecular Events in Elicitor-Plant Cell Interaction |
| Utah State Univ. Logan, UT 84322 | Neal K. Van Alfen | \$60,900 | 09/15/85 | 09/30/86 | Investigation of a Cytoplasmic Virulence Regulatory Locus in <u>Endothia Parasitica</u> |
| Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061 | George H. Lacy | \$150,000 | 09/15/85 | 09/30/87 | Genetic Dissection of Pathogenicity in <u>Erwinia carotovora</u> |
| Washington State Univ. Pullman, WA 99164 | Clarence A. Ryan | \$150,000 | 09/01/85 | 08/31/87 | Isolation and Transformation of a Wound-Induced Trypsin Inhibitor Gene from Alfalfa |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT RESPONSE TO BIOLOGICAL STRESS

85

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT PERIOD FROM TO | TITLE |
|---|---------------------------|-----------|-----------------------------|--|
| Univ. of Washington Seattle, WA 98195 | Lynn M. Riddiford | \$100,000 | 08/15/85 08/31/87 | Molecular Analysis of Eclosion Hormone in the Tobacco Hornworm, <u>Manduca sexta</u> |

TOTAL \$3,100,000

* Total award amount of \$10,000 was split-funded with
Plant Molecular Biology contributing the initial \$7,500.

ACID PRECIPITATION

This program supports research on the effects of acid precipitation on economically important plants including trees and associated microorganisms. Specific areas encouraged are: interactive effects of acidic rain with other atmospheric pollutants; effect of excess hydrogen ions and oxides of nitrogen and sulfur on heavy metal mobilization and on other soil processes; predisposition of plants exposed to acid to secondary effects e.g. pathogens; and the mechanisms of the response to acid deposition.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ACID PRECIPITATION

87

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Univ. of California Riverside, CA 92521 | Robert Musselman | \$65,000 | 09/15/85 | 09/30/86 | Effects of Acidic Fog on Agricultural Crops in California |
| Yale Univ. New Haven, CT 06520 | William Smith | \$106,605 | 08/01/85 | 07/31/88 | Rhizosphere Regulation of Heavy Metal Uptake by Forest Trees |
| Univ. of Illinois Urbana, IL 61801 | Donald Dolske | \$70,000 | 09/01/85 | 08/31/86 | A Field Study of Dry Deposition of Airborne Materials to Soybeans and Corn |
| Univ. of Illinois Urbana, IL 61801 | Wayne Banwart | \$118,000 | 09/01/85 | 08/31/87 | Differential Cultivar Response to Acidic Precipitation |
| Univ. of Minnesota St. Paul, MN 55104 | Edward Sucoff | \$48,000 | 09/15/85 | 03/31/87 | Al in the Soil Solution of the Rhizosphere: Effect on Root Viability in Pine and Oak |
| North Carolina State University Raleigh, NC 27695 | Denis DuBay | \$85,000 | 09/15/85 | 09/30/87 | The Effects of Atmospheric Pollutants on the Reproduction of Agricultural Crops |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ACID PRECIPITATION

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|----------|-------------------|--------------|--|
| Rutgers, The State University New Brunswick, NJ 08903 | Gene Hall | \$30,000 | 09/15/85 | 09/30/87 | Element Analysis of Precisely- dated Tree Rings to Study Causes of Growth Decline |
| Columbia Univ. New York, NY 10027 | Gordon Jacoby, Jr. | \$22,111 | 09/15/85 | 09/30/87 | Element Analysis of Precisely- dated Tree Rings to Study Causes of Growth Decline |
| Ohio State Univ. Res. Fdn. Columbus, OH 43212 | James McClenahan | \$52,200 | 09/01/85 | 08/31/88 | Acidic Deposition Histories Using Multi-elemental Tree-ring Analysis |
| Ohio State Univ. Res. Fdn. Columbus, OH 43212 | Benjamin Stinner | \$26,738 | 09/01/85 | 08/31/86 | Effects of Acid Precipitation on Arthropod Fauna in Conservation Tilled Corn Systems |
| Northeastern Forest Expt. Station Forest Service, USDA Broomall, PA 19008 | Keith Jensen | \$43,755 | 09/01/85 | 02/28/87 | Impact of Ozone and Aluminum on Pitch Pine and Yellow Poplar Seedling Growth |

TOTAL \$667,409

ANIMAL SCIENCE

The emphasis in this research program is to improve reproductive efficiency in domestic farm animals. Research is supported in all possible problem areas: puberty, ovulation, corpus luteum formation and function, sperm physiology, insemination, fertilization, prenatal death, and poor survival of offspring. There are two sub-programs:

Brucellosis. This sub-program area supports research at the cellular, molecular, and genetic levels to define the mechanisms by which Brucella abortus induces disease in cattle and to define the basis of the bovine interactive response with B. abortus that results in protective immunity. Proposals are also encouraged which through molecular biological analyses, identify and produce (a) antigens to differentiate non-infected, vaccinated, and the B. abortus-infected cattle, and (b) immunogens to stimulate long-lived protective immunity in cattle.

Reproductive Physiology. This sub-program area supports innovative research in the following categories: (a) Mechanisms affecting embryo survival, endocrinological control of embryo development, mechanisms of embryo-maternal interactions, and embryo implantation; (b) gamete physiology, primarily gametogenesis including maturation processes, follicle growth, ovulation, corpus luteum formation and function and superovulation; fundamental processes of fertilization mechanisms regulating gamete survival in vivo and in vitro, and basic questions regarding gamete transport and (c) fundamental questions addressing parturition, postpartum interval to conception and neonatal survival.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL SCIENCE - REPRODUCTIVE EFFICIENCY

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|---|
| Univ. of California Davis, CA 95616 | Jerry L. Hedrick | \$382,000 | 09/15/85 | 09/30/88 | Fertilization in the Pig |
| Univ. of Georgia Res. Fdn. Athens, GA 30602 | Terry Kiser | \$130,000 | 09/15/85 | 09/30/88 | Opiate Regulation of Luteinizing Hormone in the Postpartum Anestrous Beef Cow |
| Iowa State Univ. of Science & Technology Ames, IA 50011 | Lloyd L. Anderson | \$100,750 | 09/15/85 | 09/30/88 | Regulation of Relaxin and Progesterone Secretion by Aging Porcine Corpora Lutea |
| Univ. of Illinois Urbana, IL 61801 | Janice M. Bahr | \$175,000 | 09/15/85 | 09/30/88 | Effect of Age on Reproductive Efficiency of the Domestic Hen |
| Purdue Res. Fdn. West Lafayette, IN 47907 | P. V. Malven | \$199,000 | 09/01/85 | 08/31/88 | Involvement of Endogenous Opioids in the Postpartum Inhibition of LH |
| Univ. of Minnesota St. Paul, MN 55104 | M. E. El Halawani | \$181,000 | 09/15/85 | 09/30/88 | Modulation of Reproductive Efficiency by Prolactin in Domestic Turkey |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL SCIENCE - REPRODUCTIVE EFFICIENCY

91

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Univ. of Missouri Columbia, MO 65211 | B. N. Day | \$139,000 | 09/01/85 | 08/31/87 | Effect of Intrauterine Position on Subsequent Reproduction and Behavior in Swine |
| North Carolina State Univ. Raleigh, NC 27695 | Jack H. Britt | \$245,000 | 09/01/85 | 08/31/88 | Control of Ovarian Follicular Development in the Pig |
| Univ. of Nevada Reno, NV 89557 | Duane L. Garner | \$222,000 | 09/01/85 | 08/31/88 | Automated Assessment of Bovine Sperm Fertilizing Potential |
| Cornell Univ. Ithaca, NY 14853 | Robert Corradino | \$321,000 | 09/01/85 | 08/31/88 | The Role of Calcium in Bovine Corpus Luteum Function |
| Ohio State Univ. Res. Fdn. Columbus, OH 43210 | William F. Pope | \$140,000 | 09/15/85 | 09/30/88 | Estrogenic Alteration of Uterine Activity Affecting Embryo Survival in Swine |
| Texas A&M Res. Fdn. College Station, TX 77843 | David W. Forrest | \$34,000 | 09/15/85 | 09/30/86 | Endocrine Control of Bioactive Luteinizing Hormone during Sexual Maturation |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL SCIENCE - REPRODUCTIVE EFFICIENCY

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Washington State Univ. Pullman, WA 99164 | Lynette B. Corbeil | \$132,000 | 09/01/85 | 08/31/88 | Suboptimal Bovine Reproductive Efficiency: Trichomoniasis |

TOTAL \$2,400,750

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL SCIENCE - BRUCELLOSIS

93

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Agricultural Research Service, USDA P.O. Box 70 RR #2 Ames, IA 50010 | L. B. Tabatabai | \$171,000 | 09/01/85 | 08/31/88 | Recombinant Brucella Proteins for Vaccines and Diagnostic Reagents |
| Cornell Univ. Ithaca, NY 14853 | Alexander Winter | \$149,000 | 09/15/85 | 09/30/87 | Protection Induced in Rats to <u>Brucella abortus</u> by Viable and Nonviable Vaccines |
| Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061 | Gerhardt Schurig | \$160,150 | 09/01/85 | 08/31/88 | Cloning of <u>B. Abortus</u> Antigens Involved in Protective Immunity |

TOTAL \$480,150

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL SCIENCE - REPRODUCTIVE PHYSIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Univ. of California Davis, CA 95616 | Thomas E. Adams | \$173,000 | 09/01/85 | 08/31/88 | Endocrine Control of Ovulation in Sheep Actively Immunized Against GnRH |
| Univ. of Florida Gainesville, FL 32610 | Peter J. Hansen | \$225,000 | 09/15/85 | 09/30/88 | The Function of Proteins Secreted by the Periattachment Bovine Conceptus |
| Kansas State Univ. Manhattan, KS 66506 | D. L. Davis | \$207,800 | 09/01/85 | 08/31/88 | Embryonic Signals in Pregnancy Establishment in the Pig |
| Cornell Univ. Ithaca, NY 14853 | Douglas F. Antczak | \$209,800 | 09/01/85 | 08/31/88 | Invasive Trophoblast in the Genus Equus |
| Pennsylvania State Univ. University Park, PA 16802 | Gary J. Killian | \$215,850 | 09/01/85 | 08/31/88 | Bovine Oviductal Fluid Biochemistry and its Relationship to Gamete Physiology |
| Agric. Expt. Station Univ. of Tennessee Knoxville, TN 37901 | James D. Godkin | \$220,000 | 09/15/85 | 09/30/88 | Bovine Fetal-Maternal Interactions |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL SCIENCE - REPRODUCTIVE PHYSIOLOGY

95

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|----------|-------------------|--------------|--|
| Univ. of Wisconsin Madison, WI 53706 | Linda A. Schuler | \$92,000 | 09/15/85 | 09/30/87 | Synthesis and Characterization of Recombinant DNA-produced Bovine Placental Lactogen |
| Univ. of Wisconsin Madison, WI 53706 | Roy L. Ax | \$97,000 | 09/15/85 | 09/30/87 | Characteristics of Glycosaminoglycan Binding Sites in Ovarian Follicles of Cows |

TOTAL \$1,440,450

ALCOHOL RESEARCH

This program is administered under the authority of Section 1419 of Public Law 95-113, as amended, which authorizes grants for research in areas of alcohols and industrial hydrocarbons from agricultural commodities and forest products and agricultural chemicals and other products and coal derivatives. The total amount available for this program during Fiscal Year 1985 was \$518,562.

The Alcohol program funds are intended to stimulate and support energy-related research. This includes research on the evaluation (including economic), treatment, and conversion of biomass for manufacture of alcohol. Such research is national in scope, is not designed to meet the needs or address the problems of a particular State, area or locality, does not include demonstration or pilot research projects, and does not involve capital construction. Eligible institutions include colleges, universities, Government corporations and Federal laboratories. A list of the research grants awarded in Fiscal Year 1985 follows.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ALCOHOL FUELS RESEARCH

97

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|---|
| Purdue Res. Fdn. West Lafayette, IN 47907 | Nancy W. Y. Ho | \$60,000 | 09/01/85 | 08/31/87 | Improvement of Yeast Alcohol Fermentation via Genetic Engineering |
| Univ. of Massachusetts Amherst, MA 01003 | E. Canale-Parola | \$82,583 | 09/01/85 | 08/31/87 | Cellulases and Hemicellulases of Ethanol-producing Mesophilic Bacteria |
| North Carolina State Univ. Raleigh, NC 27695 | Leo W. Parks | \$95,489 | 08/01/85 | 07/31/87 | Cell Membrane Technology in the Fermentative Production of Alcohol |
| Agric. Expt. Station Cook College Rutgers Univ. New Brunswick, NJ 08903 | Douglas Eveleigh | \$103,000 | 09/01/85 | 08/31/87 | Alcohol Fuel from Zymomonas: Genetic Approaches to Enhance its use of Biomass |
| Cornell Univ. Ithaca, NY 14853 | Robert K. Finn | \$77,500 | 09/01/85 | 08/31/87 | Novel Bacterial Route for Fermenting Agricultural Residues to Alcohol |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ALCOHOL FUELS RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT PERIOD FROM TO | TITLE |
|--|---------------------------|----------|-----------------------------|---|
| Lehigh Univ. Bethlehem, PA 18015 | B. S. Montenecourt | \$99,990 | 08/01/85 07/31/87 | Formation of Interspecies Hybrids of Solvent-producing <u>Clostridia</u> |

TOTAL \$518,562

INSECT PEST SCIENCE

Before successful strategies for managing insect pests can be developed, a strong basic insect biology research effort is needed. The Insect Pest Science Program provided \$960,300 each for basic studies on boll weevil/bollworm, pine bark beetles, and gypsy moth. This program area supports research on behavioral physiology; chemical ecology; insect-host interaction; endocrinology; population dynamics; behavioral ecology; and insect pathogens, parasites and predators.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: INSECT PEST SCIENCE - BOLL WEEVIL/BOLLWORM

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Univ. of Arizona Tucson, AZ 85721 | William S. Bowers | \$80,000 | 09/15/85 | 09/30/87 | Regulation of Insecticide Transport and Metabolism by Hemolymph Proteins in the Bollworm |
| Univ. of California Davis, CA 95616 | Bruce D. Hammock | \$168,000 | 09/01/85 | 08/31/88 | Affinity Purified JH Esterase and Its Gene for Bollworm Control |
| Agricultural Research Service, USDA P.O. Box 70, RR #2 Ames, IA 50010 | Thomas A. Coudron | \$124,500 | 09/01/85 | 08/31/88 | Enzymatic Action in the Mode of Entry of <u>Nomuraea rileyi</u> into <u>Heliothis</u> Larvae |
| Univ. of Kentucky Res. Fdn. Lexington, KY 40506-0057 | Douglas L. Dahlman | \$80,000 | 09/01/85 | 08/31/87 | Endocrinology of <u>Heliothis</u> - Parasite Interactions |
| Mississippi Agric. & For. Expt. Stn. Mississippi State Univ. Mississippi State, MS 39762 | Sonny B. Ramaswamy | \$77,800 | 08/01/85 | 07/31/87 | Sensory Receptors and Cues for Oviposition by <u>heliothis</u> (Noctuidae) |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: INSECT PEST SCIENCE - BOLL WEEVIL/BOLLWORM

101

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|---|
| Agricultural Research Service, USDA P.O. Box 225 Stoneville, MS 38776 | J. E. Powell | \$100,000 | 09/15/85 | 09/30/87 | Monitoring Parasitism of <u>Heliothis</u> spp. with <u>Microplitis</u> <u>croceipes</u> Sex Pheromone |
| Agricultural Research Service, USDA P.O. Box 225 Stoneville, MS 38776 | Keith R. Hopper | \$90,000 | 09/01/85 | 08/31/87 | Effect of <u>Heliothis</u> Abundance on Control by Parasitic Wasps |
| North Carolina State Univ. Raleigh, NC 27695-7003 | Fred L. Gould | \$120,000 | 09/01/85 | 08/31/88 | Assessing the Genetic Potential of <u>Heliothis</u> spp. to Adapt to Resistant Crop Varieties |
| Texas A&M Res. Fdn. College Station, TX 77843 | J. R. Cate | \$120,000 | 09/15/85 | 09/30/87 | Ecology, Host Relationships and Biosystematics of the Boll Weevil |

TOTAL \$960,300

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PEST SCIENCE - GYPSY MOTHS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Univ. of Kentucky Res. Fdn. Lexington, KY 40506 | Thomas W. Kimmerer | \$70,000 | 09/01/85 | 08/31/87 | Role of Host Volatiles in Interaction Between <u>Agrilus</u> <u>Bilineatus</u> and Oaks |
| Univ. of Massachusetts Amherst, MA 01003 | Joseph S. Elkinton | \$180,000 | 09/01/85 | 08/31/88 | Effect of Vertebrate Predation on Gypsy Moth Population Dynamics |
| Univ. of Massachusetts Amherst, MA 01003 | Ring T. Carde | \$245,000 | 08/01/85 | 07/31/88 | Orientation of Flying Gypsy Moths to Pheromone |
| Res. Fdn. of State Univ. of New York Albany, NY 12201 | Glenn D. Prestwich | \$251,000 | 09/15/85 | 09/30/88 | Pheromone Biochemistry of Gypsy Moths |
| Univ. of Oregon Eugene, OR 97403 | George C. Carroll | \$42,000 | 08/01/85 | 07/31/86 | Fungal Egg-parasites of the Gypsy Moth: A Significant Cause of Egg Mortality? |
| Northeastern Forest Expt. Station Forest Service, USDA 370 Reed Road Broomall, PA 19008 | Thomas M. Odell | \$72,300 | 09/01/85 | 08/31/87 | Genetic Markers for Identifying Gypsy Moth Populations |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PEST SCIENCE - GYPSY MOTHS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|---|
| Pennsylvania State Univ. University Park, PA 16802 | J. C. Schultz | \$100,000 | 09/01/85 | 08/31/87 | Impact of Food Quality and Gut Physiology on Gypsy Moth Susceptibility to a Baculovirus |

TOTAL \$960,300

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: INSECT PEST SCIENCE - PINE BARK BEETLE

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Univ. of Arkansas Fayetteville, AR 72701 | F. M. Stephen | \$87,310 | 09/15/85 | 09/30/87 | Host Resistance/Suitability: Mechanisms and Impact on <u>Dendroctonus</u> Populations |
| Univ. of California Berkeley, CA 94720 | David L. Wood | \$271,600 | 09/01/85 | 08/31/88 | Bark Beetles as Indicators of and Contributors to Stress in Pondorosa Pine |
| Univ. of Florida Gainesville, FL 32611 | James L. Nation | \$104,060 | 09/01/85 | 08/31/87 | Chemical Ecology of the Black Turpentine Beetle, <u>Dendroctonus</u> <u>terebrans</u> |
| Univ. of Georgia Res. Fdn. Athens, GA 30602 | C. Wayne Berisford | \$197,330 | 09/01/85 | 08/31/88 | Evaluation of Regional Differences in Aggregating Pheromones of the Southern Pine Bark Beetle |
| North Carolina State Univ. Raleigh, NC 27695 | Fred P. Hain | \$120,000 | 09/15/85 | 09/30/87 | Host Resistance of Southern Yellow Pines to Bark Beetle Attack |
| Texas A&M Res. Fdn. College Station, TX 77843 | Thomas L. Payne | \$80,000 | 09/01/85 | 08/31/87 | Sensory Basis of Interspecific Olfactory Communication in Southern Pine Bark Beetle Complex |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: INSECT PEST SCIENCE - PINE BARK BEETLE

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|---|
| Brigham Young Univ. Provo, UT 84602 | Rex G. Cates | \$100,000 | 09/15/85 | 09/30/87 | Host Resistance/Suitability: Mechanisms and Impact on <u>Dendroctonus</u> Populations |

TOTAL \$960,300

SOYBEAN RESEARCH PROGRAM

The overall goal of this program area is to support long-term, basic biological research on soybeans that can generate new ideas, new knowledge, and innovative technologies which ultimately will contribute to increased productivity of the soybean crop. Interdisciplinary approaches are encouraged. This program area emphasizes research projects that are designed to: (1) enhance the fundamental understanding of physiology and biochemistry of the soybean, and (2) develop innovative genetic and breeding strategies for enhanced soybean germplasm.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: SOYBEAN RESEARCH

107

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|----------|-------------------|--------------|--|
| Univ. of Georgia Res. Fdn. Athens, GA 30602 | R. S. Hussey | \$61,589 | 09/15/85 | 09/30/87 | Quantification of Soybean Cyst Nematode Damage to Soybean Root Systems for Integration into Crop |
| Univ. of North. Iowa Cedar Falls, IA 50614 | Virginia S. Berg | \$53,577 | 09/15/85 | 09/30/87 | Leaf Orientation, Water Stress and Photosynthesis in Soybeans |
| Purdue Res. Fdn. West Lafayette, IN 47907 | April C. Mason | \$85,000 | 09/15/85 | 09/30/87 | Characterization of the Form of Selenium in Soybean |
| Agric. Expt. Station Univ. of Kentucky Lexington, KY 40546 | Dennis B. Egli | \$83,750 | 09/15/85 | 09/30/89 | The Genotype x Environment Interaction for the Duration of Seed Fill in Soybeans |
| Agric. Expt. Station Univ. of Kentucky Lexington, KY 40546 | Todd W. Pfeiffer | \$51,519 | 09/15/85 | 09/30/87 | Genetic Variation for Recombination Levels in Soybean |
| Univ. of Minnesota St. Paul, MN 55104 | William A. Brun | \$62,000 | 09/15/85 | 09/30/87 | Soybean Seed Growth Responses to Intermittent Water Stress |

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: SOYBEAN RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT PERIOD FROM | TO | TITLE |
|--|---------------------------|-----------|--------------------------|----------|---|
| Univ. of Missouri Columbia, MO 65211 | Virgil D. Luedders | \$100,000 | 09/15/85 | 09/30/87 | Genetics of the Cyst Nematode- Soybean Association |

TOTAL \$497,435

FOREST AND RANGELAND RENEWABLE RESOURCES PROGRAM

This is a new entry in the Competitive Research Grants Program (CRGO). It was established by Congress as special funding to the U.S. Department of Agriculture Forest Service Research. However, the funds were transferred to the neutral ground of CRGO so Forest Service scientists could also compete. When appropriating the funds, Congress stipulated that they were to be equally divided between harvesting, processing, and utilization research; and forest biology, including biotechnology. Based on Congressional intent, together with research needs identified by the forestry community, each half of the program developed its special areas of emphasis. This program is administered under the authority of Section 5 of P.L. 95-307, 16 U.S.C. 1644.

The Wood Utilization part focused on three areas: (1) Wood Chemistry and Biochemistry where breakthroughs have unlimited potential for expanding wood utilization. Basic questions needing attention include the principles governing enzymatic reactions affecting bioconversion and deterioration mechanisms, lignin and cellulose polymer modification, surface chemistry, bonding chemistry, and thermal reactions. (2) Physical/Mechanical Properties of Wood and Basic Processing Technology, which constitutes an area needing an improved base of scientific knowledge for development of new products and processes. This research is concentrated on

anatomical structures, physical and mechanical properties, and processing characteristics of both solid and reconstituted wood materials. (3) Improvements in the area of Structural Wood Engineering have long been hampered by reliance on traditional methods and a lack of technical data on the performance of wood under in-service conditions. The aim here is to encourage innovational approaches to the structural use of wood, and to gain better knowledge of interactions within a structure, develop improved reliability based designs, and increased understanding of basic failure mechanisms.

The Forest Biology part emphasizes two areas: (1) Genetic Structure and Function, which is aimed at utilizing variations and adaptations that exist in gene pools of existing populations. Research focus is on development of better techniques for genetic engineering, production on whole plants from tissue or cell culture, identification of valuable genes, and increased knowledge of genomes. (2) The objectives of Mechanisms of Interactions in Forest Systems are to gain a basic understanding of the forces that influence forest ecosystems, especially their development and productivity. Research is needed in this area that leads to increased basic knowledge of the mechanisms driving and synergistic processes, and those involved in antagonistic relationships of forest organisms.

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|---|
| Univ. of Arizona Tucson, AZ 85721 | Frank W. Telewski | \$85,234 | 09/15/85 | 09/30/87 | Response of <u>Pinus taeda</u> Ecotypes to Wind and Drought: Implication for Early Genetic Evaluation |
| Pacific Southwest Forest & Range Expt. Station Forest Service, USDA 1960 Addison Street, P.O. Box 245 Berkeley, CA 94701 | R. R. Sederoff | \$184,050 | 09/15/85 | 09/30/88 | A DNA Transfer System for Pine |
| Pacific Southwest Forest & Range Expt. Station Forest Service, USDA 1960 Addison Street, P.O. Box 245 Berkeley, CA 94701 | David B. Wagner | \$140,108 | 09/15/85 | 09/30/88 | Genetic Interactions between Chloroplast and Nuclear Genomes in a Hybrid Zone |
| Univ. of California Berkeley, CA 94720 | Richard S. Dodd | \$129,456 | 09/15/85 | 09/30/89 | Biological Mechanisms of Patterned Variation in Wood Structure in Douglas Fir |
| Pacific Southwest Forest & Range Expt. Station Forest Service, USDA 1960 Addison Street, P.O. Box 245 Berkeley, CA 94701 | F. Thomas Ledig | \$44,098 | 09/15/85 | 12/31/85 | A Workshop in Forest Biotechnology |

FOREST & RANGELAND RENEWABLE RESOURCES PROGRAM

111

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Univ. of California Davis, CA 95616 | Alison M. Berry | \$174,753 | 09/15/85 | 09/30/88 | Cytology and Physiology of Early Nodulation Events in the <u>Frankia- Alnus</u> Symbiosis |
| Colorado State Univ. Ft. Collins, CO 80523 | C. P. P. Reid | \$187,180 | 09/15/85 | 09/30/88 | Carbon Use in Mycorrhizae Symbiosis: Carbon Allocation/Phosphorus Nutrition in Pine |
| Univ. of Georgia Res. Fdn. Athens, GA 30602 | Harry E. Sommer | \$93,956 | 09/15/85 | 09/30/87 | Cloning of Forest Trees by Somatic Embryogenesis |
| Purdue Res. Fdn. West Lafayette, IN 47907 | Nancy W. Y. Ho | \$122,015 | 09/15/85 | 09/30/87 | Development of Technology for Efficient Utilization of Xylose |
| Univ. of Kentucky Res. Fdn. Lexington, KY 40546 | Louis Shain | \$181,949 | 09/15/85 | 09/30/90 | Mechanisms of Host-pathogen Interaction Between <u>Castanea</u> , <u>Quercus</u> and <u>Endothia parasitica</u> |
| Louisiana State Univ. & A&M College Baton Rouge, LA 70803 | G. B. Williamson | \$176,779 | 09/15/85 | 09/30/88 | Mechanisms of Allelopathy in Pine Forests of the Southeastern Coastal Plain |

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Southern Forest Experiment Station Forest Service, USDA U.S. Postal Svs. Bldg., Rm T-10210, 701 Loyola Ave. New Orleans, LA 70113 | Richard Hemingway | \$177,909 | 09/15/85 | 09/30/88 | Condensed Tannins as Substitutes for Resorcinol in Cold-Setting Phenolic Resins |
| Southern Forest Expt. Station Forest Service, USDA U.S. Postal Svs. Bldg., Rm T-10210, 701 Loyola Ave. New Orleans, LA 70113 | Charles McMillin | \$127,616 | 09/15/85 | 09/30/88 | A Computer Vision System for Non- Destructively Locating Defects in Lumber |
| Harvard College Cambridge, MA 02139 | John G. Torrey | \$125,394 | 09/15/85 | 09/30/87 | Cell-Wall Degrading Enzymes in Early Infection of Symbiotic Nitrogen-Fixing Trees |
| Univ. of Maryland College Park, MD 20742 | M. C. Ma | \$147,663 | 09/15/85 | 09/30/88 | <u>In vitro</u> and <u>In vivo</u> Studies of Gypsy Moth Nuclear Polyhedrosis Virus with Hybridoma Antibodies |
| Univ. of Maine Orono, ME 04469 | Michael Greenwood | \$131,725 | 09/15/85 | 09/30/87 | Gene Expression During Maturation in Conifers in Relation to Application of Biotechnology |
| Univ. of Maine Orono, ME 04469 | Barry S. Goodell | \$182,830 | 09/15/85 | 09/30/87 | Enzymatic Wood Degradation by Hymenomycetous Decay Fungi |

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Univ. of Maine Orono, ME 04469 | Michael Bentley | \$146,246 | 09/15/85 | 09/30/87 | Birchbark as a Source of Semisynthetic Antifeedants for Agricultural Insect Control |
| Michigan State Univ. East Lansing, MI 48824 | Dennis Fulbright | \$175,000 | 09/15/85 | 09/30/88 | Hypovirulence: A Mechanism to Regulate <u>Endothia parasitica</u> in Forest Ecosystem |
| Michigan State Univ. East Lansing, MI 48824 | James W. Hanover | \$161,126 | 09/15/85 | 09/30/88 | Genetic Structure and Adaptation of Natural Populations of Spruce |
| Michigan Technological Univ. Houghton, MI 49931 | D. F. Karnosky | \$82,327 | 09/15/85 | 09/30/87 | Genetic Engineering with <u>Larix</u> Species |
| Michigan Technological Univ. Houghton, MI 49931 | Peter E. Laks | \$121,656 | 09/15/85 | 09/30/88 | Copper Containing Wood Preservatives from Conifer Bark Tannins |
| Univ. of Minnesota St. Paul, MN 55104 | Wesley P. Hackett | \$141,738 | 09/15/85 | 09/30/88 | Selection of Somaclonal Variants for Resistance to <u>Septoria Musiva</u> in <u>Populus</u> |

FOREST & RANGELAND RENEWABLE RESOURCES PROGRAM

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|---|
| Univ. of Minnesota St. Paul, MN 55104 | John Grant | \$131,920 | 09/15/85 | 09/30/86 | Rheology, Drying and Biodegradation of Compacted Wood- Chip Fuels |
| MS Agric. & Forestry Expt. Station Mississippi State Univ. Mississippi State, MS 39762 | J. D. Hodges | \$100,826 | 09/15/85 | 09/30/87 | Southern Pine Beetle- Microorganism-Host Interactions: Role of the Fungi in Host Mortality |
| Southeastern Forest Experiment Station Forest Service, USDA 200 Weaver Boulevard Asheville, NC 28804 | Gene NamKoong | \$116,474 | 09/15/85 | 09/30/88 | Genetic Analysis of Forest Ecosystems |
| Southeastern Forest Experiment Station Forest Service, USDA 200 Weaver Boulevard Asheville, NC 28804 | H. R. Powers, Jr. | \$131,327 | 09/15/85 | 09/30/87 | Biotechnological Studies on Pathotypes of the Fusiform Rust Fungus |
| Res. Fdn. of State Univ. of New York Albany, NY 12201 | Wilfred A. Cote | \$132,479 | 09/15/85 | 09/30/88 | The Initiation and Propagation of Failure in Wood |

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Oregon State Univ. Corvallis, OR 97331 | Michael Newton | \$138,948 | 09/15/85 | 09/30/89 | Competitive Interactions among Western Hemlock, Red Alder, and Riparian Salmonberry |
| Oregon State Univ. Corvallis, OR 97331 | Joseph Karchesy | \$153,583 | 09/15/85 | 09/31/88 | Structures and Reactions of Polymeric Flavanoids from Whole Bark of Douglas-fir |
| Oregon State Univ. Corvallis, OR 97331 | Roy O. Morris | \$189,825 | 09/15/85 | 09/30/88 | Developing a Method for Gene Insertion on Gymnosperms |
| Oregon State Univ. Corvallis, OR 97331 | Philip E. Humphrey | \$148,871 | 09/15/85 | 09/30/88 | Pressing Wood-Based Composites: Modelling to Optimise Design and Manufacture |
| Pacific Northwest Forest & Range Expt. Station Forest Service, USDA P.O. Box 3890 Portland, OR 97208 | B T. Bormann | \$120,108 | 09/15/85 | 09/30/88 | Soil Development and Decomposition: Effects of Forest Productivity in SE Alaska |
| Northeastern Forest Experiment Station Forest Service, USDA 370 Reed Road Broomall, PA 19008 | Philip M. Wargo | \$176,217 | 09/15/85 | 09/30/88 | Interaction of <u>Armillaria</u> , Stress and Site Disturbance in Mortality in Deciduous Forests |

FOREST & RANGELAND RENEWABLE RESOURCES PROGRAM

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Pennsylvania State Univ. University Park, PA 16802 | Ming Tien | \$165,000 | 09/15/85 | 09/30/88 | Selection of Lignin-degrading Mutants of <u>Phanerochaete</u> <u>chrysosporium</u> |
| Clemson Univ. Clemson, SC 29631 | Donald D. Hook | \$187,000 | 09/15/85 | 09/30/87 | Intraspecific Variation and Physiology of Loblolly Pine to Waterlogged Soils |
| Texas A&M Res. Fdn. Box 3578 College Station, TX 77843 | Donald A. Bender | \$150,000 | 09/15/85 | 09/30/88 | Statistical Characterization of Lumber for Glued-Laminated Beams |
| Utah State Univ. Logan, UT 84322 | James N. Long | \$140,234 | 09/15/85 | 09/30/88 | Ecosystem Development: The Relation between Leaf Area, Structure, and Production |
| Intermountain Forest & Range Expt. Station Forest Service, USDA 324 25th Street Ogden, UT 84401 | Roland L. Barger | \$175,000 | 09/15/85 | 09/30/88 | Characterizing North American Lodgepole Pine as an Industrial Raw Material |
| Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061 | Thomas E. McLain | \$88,964 | 09/15/85 | 09/30/88 | Prediction of Failure Stress in Notched Wood Beams |

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061 | Frederick A. Kamke | \$100,121 | 09/15/85 | 09/30/88 | Viscoelastic Behavior of the Wood-Adhesive System During Flakeboard Manufacture |
| Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061 | Norman G. Lewis | \$171,307 | 09/15/85 | 09/30/88 | The Structure and (Bio)- conversion of Lignin in Intact Plants: A New Approach |
| Univ. of Washington Seattle, WA 98195 | Milton P. Gordon | \$230,338 | 09/15/85 | 09/30/87 | Genetic Engineering of Poplars |
| Univ. of Washington Seattle, WA 98195 | Kyosti Sarkanen | \$100,000 | 09/15/85 | 09/30/88 | Characterization and Modification of Native and Isolated Lignins |
| Univ. of Washington Seattle, WA 98195 | William T. McKean | \$58,022 | 09/15/85 | 09/30/87 | Pulping Solutions Transport |
| Weyerhaeuser Company Tacoma, WA 98477 | Francis C. Beall | \$125,700 | 09/15/85 | 09/30/89 | Analysis of Glueline Curing Using Ultrasonic Techniques |

FOREST & RANGELAND RENEWABLE RESOURCES PROGRAM

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Forest Products Laboratory Forest Service, USDA P.O. Box 5130 Madison, WI 53705 | Richard A. Horn | \$46,280 | 09/15/85 | 09/30/89 | Optimizing Design of Linerboard for Greater Compressive Strength by Press Drying |
| Forest Products Laboratory Forest Service, USDA P.O. Box 5130 Madison, WI 53705 | Thomas J. Urbanik | \$112,984 | 09/15/85 | 09/30/89 | Computer-Aided Design of Unitized Corrugated Containers for the Shipping Environment |
| Forest Products Laboratory Forest Service, USDA P.O. Box 5130 Madison, WI 53705 | Charles Gerhards | \$160,000 | 09/15/85 | 09/30/89 | Effect of Temperature and Relative Humidity on Duration of Load of Lumber |
| Univ. of Wisconsin Madison, WI 53706 | C. G. Hill, Jr. | \$175,000 | 09/15/85 | 09/30/89 | Saccharification Rates Vary with Cellulosic Substrates. Can they be Predicted? |
| Univ. of Wisconsin Madison, WI 53706 | Raymond A. Young | \$175,000 | 09/15/85 | 09/30/89 | Chemical Fractionation of Wood to Polymers and Fibers by Solvent and Derivative Techniques |

FOREST & RANGELAND RENEWABLE RESOURCES PROGRAM

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GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-------------|-------------------|--------------|---|
| Forest Products Laboratory Forest Service, USDA P.O. Box 5130 Madison, WI 53705 | Anton TenWolde | \$25,000 | 09/15/85 | 09/30/87 | Modeling Attic Humidity as a Function of Weather, Building Construction, and Ventilation Rates |
| Forest Products Laboratory Forest Service, USDA P.O. Box 5130 Madison, WI 53705 | George E. Myers | \$186,416 | 09/15/85 | 09/30/89 | Resin Curing and Bonding in Flakeboard Made by Steam- Injection Pressing |
| Univ. of Wisconsin Madison, WI 53706 | Robert E. Rowlands | \$175,000 | 09/15/85 | 09/30/88 | Strength Behavior of Bolted Wood Connections |
| TOTAL | | \$7,528,752 | | | |

SPECIAL RESEARCH GRANTS PROGRAM

The objective of this grant program is to carry out research to facilitate or expand promising breakthroughs in areas of food and agricultural sciences of importance to the Nation. Two major areas of research were funded under this program during Fiscal Year 1985:

| | |
|------------------------|-------------|
| Animal Health Research | \$5,761,800 |
| Aquaculture Research | 497,435 |
| TOTAL | \$6,259,235 |

This program is administered under the authority of Section 2(c) (1) of P.L. 89-106, as amended. Eligible institutions include land-grant colleges and universities, State agricultural experiment stations, and all colleges and universities having a demonstrable capacity in food and agricultural research.

A brief description of each of the two areas of research in the Special Research Grants Program follows with a listing of research grants awarded in each for FY 1985.

Animal Health

Overall, this research is to develop and/or refine abiotic and biotic methods to suppress animal losses from infectious and noninfectious diseases and internal and external parasites. The research is directed toward clarifying infectious and noninfectious diseases and parasites and their interactive effects on animal health; and to develop practical and implementable

management systems for the producer to prevent or alleviate these causes of animal losses.

Research includes clarification of complex or unknown etiologies, development or improvement of diagnostic methodologies, clarification of disease pathogenesis and methods of transmission, studies of resistance mechanisms and resistance-enhancing factors and development of disease prevention, control or eradication technologies.

Research is centered on highest priority animal health problems of beef and dairy cattle, swine, poultry, sheep and goats, horses and aquaculture species as identified by the Animal Health Science Research Advisory Board. This includes studies on major causes of disease losses in beef and dairy cattle production such as the respiratory disease complex, reproductive diseases including brucellosis and anestrus, enteric and digestive diseases, mastitis, bluetongue, parasites and metabolic diseases. Research on swine centers on health hazards such as enteric, reproductive and respiratory diseases, and other major problems such as pseudorabies and trichinosis. Poultry disease studies include respiratory diseases, skeletal problems, enteric, neoplastic and immunologic disorders. Sheep research includes diseases such as food rot, respiratory diseases, parasites and bluetongue. Equine health research centers on respiratory, enteric and reproductive diseases and musculo-skeletal disorders. Research on diseases in aquaculture species also is included.

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

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GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Auburn Univ. Auburn University, AL 36849 | Byron L. Blagburn | \$68,432 | 09/01/85 | 08/31/87 | Avian <u>Cryptosporidium</u> : Pathogenicity, Specificity and Interactions with other Agents |
| Auburn Univ. Auburn University, AL 36849 | J. A. Plumb | \$13,179* | 09/01/85 | 02/29/88 | Relationship of Dietary Folic Acid and Pteric Acid Anemia of Catfish |
| Univ. of California Davis, CA 95616 | Ronald Hedrick | \$76,129 | 08/01/85 | 07/31/87 | Proliferative Kidney Disease (PKD) of Salmonid Fish |
| Colorado State Univ. Ft. Collins, CO 80523 | G. E. Seidel, Jr. | \$66,047 | 09/01/85 | 08/31/86 | Cryopreservation of Bovine Embryos in Chemically Defined Media |
| Colorado State Univ. Ft. Collins, CO 80523 | B. J. Beaty | \$148,381 | 09/01/83 | 08/31/87 | Nucleic Acid Hybridization Probes: Diagnosis of Bovine Viral Reproductive Disease |
| Univ. of Connecticut Storrs, CT 06268 | John L. Augustine | \$147,031 | 09/01/85 | 08/31/88 | Phaseous Lymphadenitis in Small Ruminants |
| Univ. of Connecticut Storrs, CT 06268 | Harland Renshaw | \$149,765 | 09/15/85 | 09/30/88 | Identification and Characterization of <u>P.</u> <u>haemolytica</u> Protective Antigens |

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|------------------------|-----------|----------------|-----------|---|
| Univ. of Florida Gainesville, FL 32611 | Guy H. Palmer | \$50,131 | 09/15/85 | 09/30/87 | Development of a Subunit Diagnostic Test for Bovine Anaplasmosis |
| Univ. of Georgia Res. Fdn. Athens, GA 30602 | W. L. Ragland, III | \$114,454 | 07/01/85 | 06/30/88 | Induction of Precocious Immunity with Avian Thymic Hormone |
| Iowa State Univ. of Science & Technology Ames, IA 50011 | James A. Roth | \$149,748 | 07/01/85 | 06/30/87 | Activation of Neutrophils to Enhance Resistance to Bovine Respiratory Disease |
| Iowa State Univ. of Science & Technology Ames, IA 50011 | James A. Roth | \$97,302 | 07/01/85 | 06/30/88 | Molecular Aspects of the Interactions of <u>Brucella abortus</u> and Bovine Neutrophils |
| Iowa State Univ. of Science & Technology Ames, IA 50011 | M. J. Wannemuehler | \$62,899 | 09/15/85 | 09/30/88 | Biologic Significance of Endotoxin to the Pathogenesis of Swine Dysentery |
| Iowa State Univ. of Science & Technology Ames, IA 50011 | Henry M. Stahr | \$58,006 | 08/01/84 | 07/31/86 | Detoxification of Trichothecene Mycotoxins for Swine |

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

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GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Univ. of Illinois Champaign, IL 61820 | William Wagner | \$149,935 | 09/01/85 | 08/31/88 | Placental Hormone Synthesis and Retained Placenta in Dairy Cattle |
| Univ. of Illinois Urbana, IL 61801 | John A. Shaddock | \$100,000 | 09/01/85 | 08/31/88 | Intracellular Signaling and Modulation of Bovine Mammary Leukocytes and Endothelium |
| Univ. of Illinois Urbana, IL 61801 | David A. Stahl | \$143,854 | 09/01/85 | 08/31/88 | A Molecular Phylogeny of Mycobacteria Directed to Johne's Disease Diagnosis |
| Agric. Expt. Station Univ. of Kentucky Lexington, KY 40546 | George P. Allen | \$105,000 | 09/01/85 | 08/31/88 | Antigenic Characterization of the Major Glycoproteins of Equine Herpesvirus-1 |
| Louisiana State Univ. & A&M College Baton Rouge, LA 70803 | R. E. Corstvet | \$112,373 | 08/01/85 | 07/31/88 | Effect <u>in Vivo</u> of Components of <u>Pasteurella haemolytica</u> on Bovine Lung Disease |
| Michigan State Univ. East Lansing, MI 48824 | R. F. Slocumbe | \$146,714 | 09/15/85 | 09/30/88 | Neutrophil-mediated Mechanisms of Lung Damage in Bovine Pneumonic Pasteurellosis |

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|---|
| Michigan State Univ. East Lansing, MI 48824 | Martha H. Mulks | \$148,966 | 08/01/85 | 07/31/87 | Immunobiology and Pathogenesis of <u>Hemophilus pleuropneumoniae</u> Infection in Swine |
| Univ. of Minnesota St. Paul, MN 55104 | Kevin A. Janni | \$70,000 | 08/01/85 | 07/31/88 | Turkey Respiration System Response to Spores After Exposure to Ammonia and Dust |
| Univ. of Minnesota St. Paul, MN 55104 | T. W. Molitor | \$131,389 | 07/01/85 | 06/30/88 | Porcine Parvovirus, Pathogenicity, and Persistence in Swine |
| Univ. of Minnesota St. Paul, MN 55104 | S. K. Maheswaran | \$112,374 | 07/15/85 | 07/31/88 | In Vivo Investigations on Potential Pathogenic Factors of <u>P. haemolytica</u> |
| Univ. of Minnesota St. Paul, MN 55104 | S. M. Goyal | \$57,787 | 07/01/85 | 06/30/87 | The Concentration of Avian Influenza Virus from Water and the Environment |
| Univ. of Minnesota St. Paul, MN 55104 | H. S. Joo | \$118,650 | 07/01/85 | 06/30/88 | Seroepidemiology and Control of Pseudorabies in Swine |

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

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GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|---|
| Montana State Univ. Bozeman, MT 59717 | Clarence Speer | \$97,235 | 09/15/85 | 09/30/88 | Bovine Coccidiosis: Antigen Analysis and Immunization |
| NC Agriculture Research Service North Carolina State Univ. Raleigh, NC 27695 | E. V. De Buysscher | \$138,404 | 08/01/85 | 07/31/88 | Cloning and Expression of Newcastle Disease Virus Surface Proteins |
| Agric. Expt. Station North Dakota State Univ. Fargo, ND 58105 | Daniel L. Rock | \$149,841 | 08/01/85 | 07/31/88 | Molecular Analysis of Latent Infection with Bovine Herpesvirus Type 1 (BHV-1) |
| Univ. of North Dakota Grand Forks, ND 58202 | Stephen K. Wikel | \$100,000 | 09/01/85 | 08/31/88 | Acquired and Induced Tick Resistance: Antigen Analysis and Isolation |
| Agric. Expt. Station Univ. of Nebraska Lincoln, NE 68588 | S. Srikumaran | \$149,269 | 09/01/85 | 08/31/88 | Lymphokine Regulation of Antibody Production in Bovine Respiratory Infections |
| Ohio State Univ. Res. Fdn. Columbus, OH 43212 | Yehia M. Saif | \$74,230 | 09/01/85 | 08/31/87 | Viral Enteritis of Turkeys and Chickens: The Role of Astro-like Viruses |

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Ohio State Univ. Res. Fdn. Columbus, OH 43212 | Kenneth Smith | \$70,915 | 07/15/85 | 07/31/87 | Pathogenesis of Coliform Bacteria in the Nonlactating Bovine Mammary Gland |
| Ohio State Univ. Columbus, OH 43212 | K. W. Theil | \$90,550 | 09/01/85 | 08/31/88 | Improved Methods for Detecting Porcine Rotavirus-like Virus Infections |
| Ohio State Univ. Res. Fdn. Columbus, OH 43212 | Linda J. Saif | \$149,996 | 09/01/85 | 08/31/88 | Pathogenesis of Coronavirus Infections and Passive Immunity in Calves |
| Oklahoma State Univ. Stillwater, OK 74078 | M. J. Gentry | \$150,000 | 07/01/85 | 06/30/88 | <u>P. haemolytica</u> cytotoxin: Molecular Studies of Pathogenesis and Immunogenicity |
| Oregon State Univ. Corvallis, OR 97331 | Jeffrey Barlough | \$90,000 | 07/15/85 | 07/31/87 | Pathogenesis of Tillamook Calicivirus Infection in Calves |
| Univ. of Pennsylvania Philadelphia, PA 19104 | Benjamin Wolf | \$90,465 | 07/15/85 | 07/31/88 | Rapid Immunoisoelectric Focusing Test for Avian Influenza and Newcastle Disease Viruses |

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

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GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Pennsylvania State Univ. University Park, PA 16802 | F. G. Ferguson | \$148,421 | 09/15/85 | 09/30/88 | Piglet Respiratory and Enteric Cellular Immune Responses to Pseudorabies Virus |
| Pennsylvania State Univ. University Park, PA 16802 | Richard A. Wilson | \$134,360 | 09/01/85 | 08/31/87 | Functions of Mammary Gland Lymphocytes and Effects of Dry Gland Secretions |
| Medical Univ. of South Carolina 171 Ashley Ave. Charleston, SC 29425 | Eric R. James | \$29,511 | 09/15/85 | 03/31/87 | Cryoreservation of Trichinella |
| South Dakota State Univ. Brookings, SD 57007 | David A. Benfield | \$68,007 | 09/15/85 | 09/30/87 | Role of Cellular Receptors in the Pathogenesis of Porcine Enteric Viral Infections |
| Agric. Expt. Station Univ. of Tennessee P.O. Box 1071 Knoxville, TN 37901 | L. N. D. Potgieter | \$149,418 | 09/15/85 | 09/30/88 | Cloning and Hybridization Probes in Pathogenesis Studies |

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Agric. Expt. Station Univ. of Tennessee Knoxville, TN 37901 | David A. Brian | \$150,000 | 09/15/85 | 09/30/88 | Development of Potential Enteric Coronavirus Vaccine Sources Using Recombinant DNA |
| Texas A&M Res. Fdn. College Station, TX 77843 | J. Templeton | \$136,331 | 09/01/85 | 08/31/87 | Genetic Control of Macrophage Function in Bovine Brucellosis |
| Baylor College of Medicine Houston, TX 77030 | Marc H. Dresden | \$123,826 | 09/01/85 | 08/31/87 | Biochemical and Immunological Studies of Infection by <u>Strongyloides ransomi</u> |
| Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061 | Craig Hammerberg | \$76,489 | 08/01/85 | 07/31/88 | Immunomodulating Factor(s) Produced by a Porcine Lymphoblastoid Cell Line |
| Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061 | Yasuko Rikihisa | \$73,040 | 09/01/85 | 08/31/86 | Pathogenic Mechanisms and Immune Response in Potomac Horse Fever |
| Washington State Univ. Pullman, WA 99164 | R. G. Breeze | \$57,000 | 09/01/83 | 08/31/87 | Subunit and Synthetic Peptide Vaccines and Rapid Diagnostic Kits for Vesicular Diseases |

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

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GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Washington State Univ. Pullman, WA 99164 | Bruce A. Watkins | \$99,539 | 09/15/85 | 09/30/87 | Control of Abnormal Lipid Metabolism Observed during Fatty Liver and Kidney Syndrome and Sudden Death Syndrome in Broiler Chicks |
| Washington State Univ. Pullman, WA 99164 | Tilahun Yilma | \$139,303 | 09/01/85 | 08/31/87 | A Polyvalent Vaccinia Virus Recombinant Vaccine for Bluetongue |
| Washington State Univ. Pullman, WA 99164 | Lynette Corbeil | \$149,984 | 09/01/85 | 08/31/88 | A Subunit Vaccine for Trichomoniasis |
| Washington State Univ. Pullman, WA 99164 | James A. Magnuson | \$93,640 | 09/01/85 | 08/31/88 | Development of a Vaccine to <u>Escherichia coli</u> Heat-stable Enterotoxin |
| Univ. of Wisconsin Madison, WI 53706 | Kevin T. Schultz | \$120,316 | 09/15/85 | 08/31/87 | A Bluetongue Anti-Idiotypic Vaccine |

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|----------|-------------------|--------------|---|
| Univ. of Wisconsin Madison, WI 53706 | Ronald D. Schultz | \$63,164 | 09/15/85 | 09/30/86 | Liposome Antibiotic Activated Phagocytes to Treat and/or Prevent Mastitis |

TOTAL \$5,761,800

* Total award amount of \$76,912 was split-funded with
Aquaculture Research contributing the initial \$63,733.

Aquaculture

The purpose of this program area is to provide and/or improve upon the scientific and technical base needed by the aquaculture industry. This industry has been expanding rapidly. Problems of nutrition, breeding, physiology, management, disease and parasite control are important and are becoming more limiting as the size of the industry and its concentration have increased.

Interest is focused on local and regional problems for which solutions will contribute to national objectives related to aquaculture production.

The specific objectives of the research are: (1) improved production efficiency through diet formulation, reproduction and breeding, and disease and parasite control; (2) improved water quality for production and control of factors affecting the quality of water discharge; and (3) increased production of freshwater species having high production potential such as catfish, trout, bait minnows, and crawfish.

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: AQUACULTURE RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Auburn Univ. Auburn University, AL 36849 | R. T. Lovell | \$49,698 | 09/01/85 | 08/31/87 | Ascorbic Acid and Disease Resistance in Channel Catfish |
| Auburn Univ. Auburn University, AL 36849 | J. A. Plumb | \$63,733* | 09/01/85 | 02/29/88 | Relationship of Dietary Folic Acid and Pteric Acid to Anemia of Catfish |
| Univ. of Georgia Res. Fdn. Athens, GA 30602 | Emmett Shotts, Jr. | \$80,000 | 09/01/85 | 08/31/87 | Protozoan Interaction in Bacterial Fish Diseases |
| Purdue Res. Fdn. West Lafayette, IN 47907 | Charles Chrisman | \$56,238 | 09/01/85 | 08/31/87 | Hybridization and Polyploidization of Catfish for Improved Performance |
| Agric. & Forestry Expt. Station Mississippi State Univ. P.O. Drawer ES Mississippi State, MS 39762 | John A. Boyle | \$59,548 | 09/15/85 | 09/15/87 | Nucleic Acid Probes as Diagnostic Tools in Channel Catfish |
| Univ. of Oklahoma Norman, OK 73019 | William L. Shelton | \$48,555 | 08/15/83 | 08/31/87 | Comparative Efficacy of Two Gonadotropic Agents to Induce Ovulation in Paddlefish |

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: AQUACULTURE RESEARCH

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GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|----------|-------------------|--------------|---|
| Oregon State Univ. Corvallis, OR 97331 | John S. Rohovec | \$60,690 | 09/15/85 | 09/30/88 | Development of an Effective Vaccine Against <u>Aeromonas</u> <u>salmonicida</u> |
| Univ. of Washington Seattle, WA 98195 | Walton W. Dickhoff | \$78,973 | 09/01/85 | 04/30/87 | Atlantic Salmon Net-pen Farming: Techniques for Efficient Broodstock Rearing |

TOTAL \$497,435

* Total award amount of \$76,912 was split-funded with
Animal Health Research contributing the remaining
\$13,179.

RANGELAND RESEARCH GRANTS

Rangeland Grants are awarded to support basic research in certain areas of rangeland research such as (1) Management of rangelands and agricultural land as integrated systems for more efficient utilization of crops and waste products in the production of food and fiber, (2) methods of managing rangeland watersheds to maximize efficient use of water and improve water yield, water quality and water conservation to protect against onsite and offsite damage of rangeland resources from floods, erosion and other detrimental influences, and to remedy unsatisfactory and unstable rangeland conditions, and (3) revegetation and rehabilitation of rangeland including the control of undesirable species of plants.

COOPERATIVE STATE RESEARCH SERVICE
PROGRAM AREA: RANGELAND RESEARCH

135

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|----------|-------------------|--------------|---|
| Univ. of Arizona Tucson, AZ 85721 | James Klermedson | \$78,688 | 08/15/85 | 08/14/90 | Soil Fertility Factors Controlling Secondary Succession on Subalpine Ranges of Utah |
| Agric. Expt. Station Univ. of Nebraska Lincoln, NE 68583 | Terry Klopfenstein | \$78,728 | 08/15/85 | 02/29/88 | Optimum Use of Rangeland, Pasture and Crop Residues in Beef Production Systems |
| Oregon State Univ. Corvallis, OR 97331 | J. A. Moore | \$79,540 | 08/15/85 | 02/29/88 | Evaluating the Water Quality Impacts of Six Rangeland Management Systems |
| Agric. Expt. Station Texas A&M Univ. College Station, TX 77843 | Wilbert Blackburn | \$50,000 | 09/01/85 | 08/31/87 | Vegetation Management for Improved Water Use Efficiency and Water Yield on Texas Rangelands |
| Utah State Univ. Logan, UT 84322 | Neil E. West | \$79,998 | 08/15/85 | 08/31/88 | Some Responses of Soil Microphytic Crusts to Livestock Trampling |
| Utah State Univ. Logan, UT 84322 | Frederick Provenza | \$50,000 | 09/01/85 | 08/31/88 | Diet Training Management: A New Approach to Increasing Rangeland and Livestock Production |

COOPERATIVE STATE RESEARCH SERVICE
PROGRAM AREA: RANGELAND RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT PERIOD FROM TO | TITLE |
|--|---------------------------|----------|-----------------------------|--|
| Utah State Univ. Logan, UT 84322 | Edith B. Allen | \$63,196 | 08/15/85 08/31/87 | Interactions of Range Grasses, Weeds, and VA Mycorrhizae: Carbon Balance and Competition |

TOTAL \$480,150

SMALL BUSINESS INNOVATION RESEARCH PROGRAM

The objectives of this program are to stimulate technological innovation in the private sector, to strengthen the role of small business in meeting Federal research and development needs, to increase private sector commercialization and development efforts, and to encourage participation of small and disadvantaged firms in technological innovation.

The program emphasizes support of high-quality research and development proposals containing advanced concepts related to important agricultural problems and opportunities that could lead to significant public benefits. The areas considered in this program are broad and encompass a wide range of agricultural sciences. The subtopics include: (1) air, water and soils, (2) animal production and protection, (3) food science and nutrition, (4) forests and related resources, (5) plant production and protection, and (6) rural and community development.

In Fiscal Year 1985, USDA awarded both Phase I and Phase II grants. Phase I grants are primarily for research designed to determine technical feasibility of the proposed approach or concept. Phase II grants are awarded to those Phase I projects that have shown sufficient promise for further support. The total amount awarded in Fiscal Year 1985 was \$3,150,946.

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: AIR, WATER & SOILS

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|---|
| Agricultural Electronics Corporation 4020 East Coronado Drive Tucson, AZ 85718 | William Gensler | \$49,912 | 09/15/85 | 03/31/86 | An Active Electrochemical Instrument System for Determination of Water Stress |
| Kanterter, Inc. P.O. Box 30327 Lincoln, NE 68503 | John A. Eastin | \$200,000 | 09/15/85 | 09/30/87 | Facilitating the Colonization of Plant Roots by Beneficial Microorganisms |
| R&A Plant/Soil, Inc. 24 Pasco - Kahlotus Road Pasco, WA 99301 | Blaine Metting | \$49,596 | 09/15/85 | 03/31/86 | Palmelloid Microalgae as Soil- conditioning Agents |

TOTAL \$299,508

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: ANIMAL PRODUCTION & PROTECTION

139

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|----------|-------------------|--------------|--|
| Memory Metals, Inc. 84 West Park Place Stamford, CT 06901 | James Stice | \$46,720 | 09/15/85 | 03/31/86 | Natural Ventilation Management of Livestock Buildings using Shape Memory Alloys |
| Prime-Color, Inc. 8 Knight Road Wayne, NJ 07470 | W. A. Thornton | \$43,167 | 09/15/85 | 03/31/86 | Lamplight Designed Specifically to Ease USDA Meat-Inspection |
| Bionique Laboratories, Inc. Bloomingdale Road Saranac Lake, NY 12983 | Steven J. Geary | \$49,974 | 09/15/85 | 03/31/86 | Improved DNA Probe for the Rapid Detection of <u>Mycoplasma</u> <u>gallisepticum</u> |
| Lee Scientific, Inc. 379 N. University, #102 Provo, UT 84601 | Douglas Later | \$49,996 | 09/15/85 | 03/31/86 | Supercritical Fluid Extraction and Analysis of Residues in Meats |

TOTAL \$189,857

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: FOOD SCIENCE & NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|------------------------|-----------|----------------|-----------|---|
| Hemogenetics, Inc. P.O. Box 5459 Berkeley, CA 94705 | G. P. Der-Balian | \$50,000 | 09/15/85 | 03/31/86 | Salmonella Measurement with Bioluminescent Immunoassay |
| IDETEK, Inc 1057 Sneath Lane San Bruno, CA 94066 | Prithipal Singh | \$45,000 | 09/15/85 | 03/31/86 | A Non-Instrumented Immunoassay for Aflatoxin B ₁ |
| ST&E Technical Services, Inc. 20 Belinda Court San Ramon, CA 94583 | Stanley Klainer | \$40,000 | 09/15/85 | 03/31/86 | Unique Measurement of Nutrients Fluxes Using Fiber Optics |
| Hawaii Biotechnology Group, Inc. 99-193 Aiea Heights Drive Aiea, HI 96701 | Douglas C. Vann | \$200,000 | 09/01/85 | 08/31/87 | Rapid Detection of Carbamate Pesticides in Food and Environmental Samples |
| Lembeck Associates, Inc. 7900 College Boulevard Overland Park, KS 66210 | Henry G. Lembeck | \$48,709 | 09/15/85 | 03/31/86 | Containerized Bulk Export Shipment of Wheat Flour and Other Powder and Granular Food Products |

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: FOOD SCIENCE & NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Universal Sensors, Inc. P.O. Box 736 New Orleans, LA 70148 | Glenn Lubrano | \$40,625 | 09/15/85 | 03/31/86 | Rapid, Novel Methods for Determining Total Protein, Protein Quality, and Sucrose |
| Innovative Tehcnology, Inc. Box 10072, Southern Station Hattiesburg, MS 39406 | Willard Douglas | \$50,000 | 09/01/84 | 08/31/86 | Development of Dry Film Assay for the Rapid Detection of Trichinosis in Swine |
| American Research Corporation of Virginia P.O. Box 3406 Radford, VA 24143 | Russell Churchill | \$249,000 | 09/15/85 | 09/30/87 | Laser Diagnostics of Microbial Populations in Food Processing Systems |

TOTAL \$723,334

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: FOREST & RELATED RESOURCES

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|--|---------------------------|-----------|-------------------|--------------|--|
| Engineering Data Management, Inc. P.O. Box 1774 Ft. Collins, CO 80522 | G. Brent Fagan | \$195,000 | 09/01/85 | 08/31/87 | Reliable Strength Assessment of Wood Composites Using Non- destructive Evaluation Techniques |
| Woodland Services, Inc. Box 257 Moose Lake, MN 55767 | David L. Eggen | \$50,000 | 09/15/85 | 03/31/86 | Integration of Mechanical and Chemical Forest Site Preparation Techniques |
| Mater Engineering, Ltd. P.O. Box O Corvallis, OR 97339 | M. Scott Mater | \$47,520 | 09/15/85 | 03/31/86 | Lumber Yield Value Optimization through Market-responsive Log Yard Management |
| National Gypsy Moth Management Group, Inc. R. D. #1, Box 715 Landisburg, PA 17040 | Mark Ticehurst | \$34,776 | 09/15/85 | 03/31/86 | Reducing Cost and Improving Effectiveness of Gypsy Moth Parasites in IPM |
| Efficient Machinery Company 220 - 111th Avenue, S.E. Bellevue, WA 98004 | Peter Hammerschlag | \$250,000 | 09/15/85 | 09/30/87 | Systematic Analysis of Central Passage Circular Sawing Processing |

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: FOREST & RELATED RESOURCES

143

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT PERIOD FROM TO | TITLE |
|---|---------------------------|----------|-----------------------------|---|
| AMINEX Company P.O. Box 4174 Federal Way, WA 98063 | Robert Arsenault | \$45,970 | 09/15/85 03/31/86 | Stress Wave Analysis of Wood Piles Related to Ultimate Compressive Strength |

TOTAL \$623,266

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: PLANT PRODUCTION & PROTECTION

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Plant Genetics, Inc. 1930 Fifth Street Davis, CA 95616 | M. K. Redenbaugh | \$47,880 | 09/15/85 | 03/31/86 | Artificial Seeds: Encapsulation of Somatic Embryos |
| ST&E Technical Services, Inc. 20 Belinda Court San Ramon, CA 94583 | Stanley Klainer | \$40,000 | 09/15/85 | 03/31/86 | Fiber Optic Chemical Sensors for In-Situ O ₂ , CO ₂ , and H ₂ O Measurements During Photosynthesis |
| Citrex Technologies, Inc. 728 NW Avenue Gainesville, FL 32602 | John D. Cox | \$49,815 | 09/15/85 | 03/31/86 | The Use of X-rays to Disinfest Grapefruit of Carib Fly within the Packinghouse |
| Photics, Inc. 98 Old Lowell Road Westford, MA 01886 | Rudolph Bradbury | \$230,000 | 09/15/85 | 09/30/87 | Holographic Sunlight Distribution for High Efficiency Greenhouses |
| Bio-Metric Systems, Inc. 9932 West 74th Street Eden Prairie, MN 55344 | Patrick E. Guire | \$249,000 | 09/15/85 | 09/30/87 | Enzyme Immunoassay Technology and Fieldable Assay Kits for Plant Pathogens |

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: PLANT PRODUCTION & PROTECTION

145

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| Hunt Farms 4021 Italy Hill Road Branchport, NY 14418 | Derek J. Wilber | \$129,000 | 09/15/85 | 09/30/87 | Management of Field Grafted Grapevines in Cold Climate Vineyards |
| Decagon Devices, Inc. NW 800 Fisk Pullman, WA 99163 | Grant A. Harris | \$33,295 | 09/15/85 | 03/31/86 | A Rapid Method of Quantifying Root Area and Length |
| TOTAL | | \$778,990 | | | |

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: RURAL & COMMUNITY DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|-----------|-------------------|--------------|--|
| SRM Corporation 2653 West 32nd Avenue Denver, CO 80211 | James A. Kent | \$49,500 | 09/15/85 | 03/31/86 | A New Method for Efficient Mapping of Human Geographical Boundaries in Rural Areas |
| DUAL-Comm, Inc. Suite 1250, 1015 Fifteenth St., N.W. Washington, DC 20005 | John C. Beresford | \$249,000 | 09/15/85 | 09/30/87 | Local Area Leading Indicators |
| Associated Enterprise Development, Inc. 120 Admiral Cochrane Drive Annapolis, MD 21401 | Leonard Blackshear | \$44,895 | 09/15/85 | 03/31/86 | Aiding Rural Governments and Institutions through Voice Messaging Technology |
| Incubator Technologies, Inc. Twitty Park-Research Drive, Route 4, Box 519 Rolla, MD 65401 | F. Terry Nixon | \$100,000 | 09/01/84 | 08/31/86 | Development of the High-tech Incubator Concept for a Rural/University Setting |

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: RURAL & COMMUNITY DEVELOPMENT

147

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | TITLE |
|---|---------------------------|----------|-------------------|--------------|--|
| American Forest Mushroom Association, Inc. P.O. Box 1362 Asheville, NC 28802 | Toby J. Farris | \$49,860 | 09/15/85 | 03/31/86 | Inoculation Techniques for Forest Mushroom (L. edodes) Production |
| E. P. Systems Group, Inc. 332 West Fairmont Avenue State College, PA 16801 | Eugene J. Bazan | \$42,736 | 09/15/85 | 03/31/86 | The Feasibility of a Manual for Rural Economic Developers |
| | | TOTAL | \$535,991 | | |

FOOD AND AGRICULTURAL SCIENCES NATIONAL NEEDS
GRADUATE FELLOWSHIPS GRANT PROGRAM

This program was initiated because of increasing concern about growing shortages of trained professionals in the food and agricultural sciences. The objective of the program is to encourage outstanding students (U.S. citizens) to pursue and complete a graduate degree in an area of the food and agricultural sciences for which there is a national need for the development of scientific expertise. The Fiscal Year 1985 program consisted of grants to colleges and universities with superior graduate teaching and research programs in the targeted areas of the food and agricultural sciences. Fellowships were awarded in the following areas in Fiscal Year 1985 as renewals to those institutions receiving 1984 awards.

| | |
|---------------------------------|--------------------|
| Agricultural Engineering | \$ 991,818 |
| Biotechnology | 1,487,029 |
| Food and Agricultural Marketing | 1,186,898 |
| Food Science/Human Nutrition | 1,184,255 |
| | <u>\$4,850,000</u> |

This program is administered under the authority of Section 1417(a) (3) (B) of P.L. 95-113, as amended (7 U.S.C. 3103). Eligible institutions include all U.S. colleges and universities which confer a Master's or doctoral degree in an area of the food and agricultural sciences targeted for national needs fellowships.

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: AGRICULTURAL ENGINEERING

149

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIP SUPPORTED |
|--|---------------------------|----------|-------------------|--------------|-------------------------|
| Univ. of Arizona Tucson, AZ 85721 | William G. Matlock | \$7,534 | 09/15/84 | 03/31/88 | 1 Master's |
| Univ. of Arizona Tucson, AZ 85721 | William G. Matlock | \$5,016 | 09/15/84 | 03/31/88 | 1 Master's |
| Colorado State Univ. Ft. Collins, CO 80523 | D. B. McWhorter | \$40,902 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Colorado State Univ. Ft. Collins, CO 80523 | D. B. McWhorter | \$63,884 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Univ. of Florida Gainesville, FL 32611 | D. E. Buffington | \$38,404 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Univ. of Florida Gainesville, FL 32611 | J. W. Mishoe | \$27,268 | 09/15/84 | 03/31/88 | 4 Doctoral |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: AGRICULTURAL ENGINEERING

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIP SUPPORTED |
|---|---------------------------|----------|-------------------|--------------|-------------------------|
| Univ. of Hawaii at Manoa Honolulu, HI 96822 | D. Singh | \$6,535 | 09/15/84 | 03/31/88 | 1 Master's |
| Univ. of Hawaii at Manoa Honolulu, HI 96822 | D. Singh | \$5,016 | 09/15/84 | 03/31/88 | 1 Master's |
| Purdue Res. Fdn. West Lafayette, IN 47907 | Edwin J. Monke | \$27,268 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Purdue Res. Fdn. West Lafayette, IN 47907 | Edwin J. Monke | \$42,707 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Iowa State Univ. of Science & Technology Ames, IA 50011 | T. A. Austin | \$68,170 | 09/15/84 | 03/31/88 | 10 Doctoral |
| Iowa State Univ. of Science & Technology Ames, IA 50011 | T. A. Austin | \$96,010 | 09/15/84 | 03/31/88 | 10 Doctoral |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: AGRICULTURAL ENGINEERING

151

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIP SUPPORTED |
|---|---------------------------|----------|-------------------|--------------|-------------------------|
| Univ. of Maryland College Park, MD 20742 | Fred W. Wheaton | \$44,117 | 09/15/84 | 03/31/88 | 2 Master's, 5 Doctoral |
| Univ. of Maryland College Park, MD 20742 | Fred W. Wheaton | \$60,809 | 09/15/84 | 03/31/88 | 2 Master's, 5 Doctoral |
| Univ. of Nebraska Lincoln, NE 68588 | William Splinter | \$40,902 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Univ. of Nebraska Lincoln, NE 68588 | William Splinter | \$59,182 | 09/15/84 | 03/31/88 | 6 Doctoral |
| North Carolina State Univ. Raleigh, NC 27695 | R. W. Skaggs | \$38,404 | 09/15/84 | 03/31/88 | 4 Doctoral |
| North Carolina State Univ. Raleigh, NC 27695 | R. W. Skaggs | \$27,268 | 09/15/84 | 03/31/88 | 4 Doctoral |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: AGRICULTURAL ENGINEERING

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIP SUPPORTED |
|--|---------------------------|----------|-------------------|--------------|-------------------------|
| Ohio State Univ. Columbus, OH 43212 | Warren L. Roller | \$5,016 | 09/15/84 | 03/31/88 | 1 Master's |
| Ohio State Univ. Research Foundation Columbus, OH 43212 | Warren L. Roller | \$6,402 | 09/15/84 | 03/31/88 | 1 Master's |
| Oklahoma State Univ. Stillwater, OK 74078 | Gerald Brusewitz | \$57,606 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Oklahoma State Univ. Stillwater, OK 74078 | Gerald Brusewitz | \$40,902 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Oregon State Univ. Corvallis, OR 97331 | Richard H. Cuenca | \$21,240 | 09/15/84 | 03/31/88 | 3 Master's |
| Oregon State Univ. Corvallis, OR 97331 | Richard H. Cuenca | \$15,048 | 09/15/84 | 03/31/88 | 3 Master's |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: AGRICULTURAL ENGINEERING

153

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|---|---------------------------|----------|-------------------|--------------|--------------------------|
| Clemson Univ. Clemson, SC 29631 | James T. Ligon | \$6,817 | 09/15/84 | 03/31/88 | 1 Doctoral |
| Clemson Univ. Clemson, SC 29631 | James T. Ligon | \$9,601 | 09/15/84 | 03/31/88 | 1 Doctoral |
| South Dakota State Univ. Brookings, SD 57007 | Mylo A. Hellickson | \$25,608 | 09/15/84 | 03/31/88 | 4 Master's |
| South Dakota State Univ. Brookings, SD 57007 | Mylo A. Hellickson | \$20,064 | 09/15/84 | 03/31/88 | 4 Master's |
| Texas A&M Univ. College Station, TX 77843 | Edward A. Hiler | \$33,341 | 09/15/84 | 03/31/88 | 5 Doctoral |
| Texas A&M Univ. College Station, TX 77843 | Edward A. Hiler | \$48,749 | 09/15/84 | 03/31/88 | 5 Doctoral |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: AGRICULTURAL ENGINEERING

GRANTS AWARDED FOR FISCAL YEAR 1984

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIP SUPPORTED |
|--|---------------------------|----------|-------------------|--------------|-------------------------|
| Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061 | C. G. Haugh | \$25,608 | 09/15/84 | 03/31/88 | 4 Master's |
| Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061 | C. G. Haugh | \$20,064 | 09/15/84 | 03/31/88 | 4 Master's |
| Univ. of Wyoming Laramie, WY 82071 | J. L. Smith | \$20,064 | 09/15/84 | 03/31/88 | 4 Master's |
| Univ. of Wyoming Laramie, WY 82071 | J. L. Smith | \$32,302 | 09/15/84 | 03/31/88 | 4 Master's |

TOTAL \$1,087,828

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: BIOTECHNOLOGY

155

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|---|---------------------------|----------|-------------------|--------------|--------------------------|
| Univ. of California Berkeley, CA 94720 | Russell L. Jones | \$34,085 | 09/15/84 | 03/31/88 | 5 Doctoral |
| Univ. of California Berkeley, CA 94720 | Russell L. Jones | \$48,005 | 09/15/84 | 03/31/88 | 5 Doctoral |
| Univ. of California Los Angeles, CA 90024 | J. P. Thornber | \$34,757 | 09/15/84 | 03/31/88 | 5 Doctoral |
| Univ. of California Los Angeles, CA 90024 | J. P. Thornber | \$49,847 | 09/15/84 | 03/31/88 | 5 Doctoral |
| Univ. of California Riverside, CA 92521 | John V. Leary | \$76,808 | 09/15/84 | 03/31/88 | 8 Doctoral |
| Univ. of California Riverside, CA 92521 | John V. Leary | \$54,536 | 09/15/84 | 03/31/88 | 8 Doctoral |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: BIOTECHNOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|--|---------------------------|----------|-------------------|--------------|--------------------------|
| Stanford Univ. Stanford, CA 94305 | Harold A. Mooney | \$62,339 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Stanford Univ. Stanford, CA 94305 | Harold A. Mooney | \$24,484 | 09/15/84 | 03/31/88 | 5 Doctoral |
| Colorado State Univ. Ft. Collins, CO 80523 | Gordon Niswender | \$50,986 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Colorado State Univ. Ft. Collins, CO 80523 | Gordon Niswender | \$27,268 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Univ. of Chicago Chicago, IL 60637 | L. J. Mets | \$30,035 | 09/15/84 | 03/31/88 | 5 Doctoral |
| Univ. of Chicago Chicago, IL 60637 | L. J. Mets | \$61,086 | 09/15/84 | 03/31/88 | 5 Doctoral |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: BIOTECHNOLOGY

157

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|---|---------------------------|----------|-------------------|--------------|--------------------------|
| Univ. of Illinois Urbana, IL 61801 | J. A. Shaddock | \$57,606 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Univ. of Illinois Urbana, IL 61801 | J. A. Shaddock | \$40,902 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Purdue Res. Fdn. West Lafayette, IN 47907 | Bill R. Baumgardt | \$39,456 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Purdue Res. Fdn. West Lafayette, IN 47907 | Bill R. Baumgardt | \$59,052 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Univ. of Iowa Iowa City, IA 52242 | John E. Butler | \$40,902 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Univ. of Iowa Iowa City, IA 52242 | John E. Butler | \$62,449 | 09/15/84 | 03/31/88 | 6 Doctoral |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: BIOTECHNOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|---|---------------------------|----------|-------------------|--------------|--------------------------|
| Massachusetts Institute of Technology Cambridge, MA 02139 | M. Karel | \$54,880 | 09/15/84 | 03/31/88 | 5 Doctoral |
| Massachusetts Institute of Technology Cambridge, MA 02139 | M. Karel | \$27,210 | 09/15/84 | 03/31/88 | 5 Doctoral |
| Michigan State Univ. East Lansing, MI 48824 | K. D. Nadler | \$34,221 | 09/15/84 | 03/31/88 | 5 Doctoral |
| Michigan State Univ. East Lansing, MI 48824 | K. D. Nadler | \$52,654 | 09/15/84 | 03/31/88 | 5 Doctoral |
| Univ. of Minnesota St. Paul, MN 55108 | Burle Gengenbach | \$38,404 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Univ. of Minnesota St. Paul, MN 55108 | Burle Gengenbach | \$27,268 | 09/15/84 | 03/31/88 | 4 Doctoral |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: BIOTECHNOLOGY

159

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|--|---------------------------|----------|-------------------|--------------|--------------------------|
| Univ. of Missouri Columbia, MO 65211 | J. N. Berg | \$19,158 | 09/15/84 | 03/31/88 | 3 Doctoral |
| Univ. of Missouri Columbia, MO 65211 | J. N. Berg | \$30,096 | 09/15/84 | 03/31/88 | 3 Doctoral |
| Univ. of Missouri Columbia, MO 65211 | Douglas D. Randall | \$54,536 | 09/15/84 | 03/31/88 | 8 Doctoral |
| Univ. of Missouri Columbia, MO 65211 | Douglas D. Randall | \$80,565 | 09/15/84 | 03/31/88 | 8 Doctoral |
| Cornell Univ. Ithaca, NY 14853 | Robert Turgeon | \$40,902 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Cornell Univ. Ithaca, NY 14853 | Robert Turgeon | \$57,606 | 09/15/84 | 03/31/88 | 6 Doctoral |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: BIOTECHNOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|---|---------------------------|----------|-------------------|--------------|--------------------------|
| Texas A&M Univ. College Station, TX 77843 | Thomas O. Baldwin | \$47,719 | 09/15/84 | 03/31/88 | 7 Doctoral |
| Texas A&M Univ. College Station, TX 77843 | Thomas O. Baldwin | \$67,207 | 09/15/84 | 03/31/88 | 7 Doctoral |

TOTAL \$1,487,029

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD & AGRICULTURAL MARKETING

161

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|--|---------------------------|----------|-------------------|--------------|--------------------------|
| Auburn Univ. Auburn University, AL 36849 | Gregory Sullivan | \$19,202 | 09/15/84 | 03/31/88 | 2 Doctoral |
| Auburn Univ. Auburn University, AL 36849 | William E. Hardy | \$13,634 | 09/15/84 | 03/31/88 | 2 Doctoral |
| Univ. of California Berkeley, CA 94720 | S. Robinson | \$27,268 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Univ. of California Berkeley, CA 94720 | S. Robinson | \$38,404 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Univ. of California Berkeley, CA 94720 | Dennis Teeguarden | \$28,803 | 09/15/84 | 03/31/88 | 3 Doctoral |
| Univ. of California Berkeley, CA 94720 | Dennis Teeguarden | \$20,451 | 09/15/84 | 03/31/88 | 3 Doctoral |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD & AGRICULTURAL MARKETING

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|--|---------------------------|----------|-------------------|--------------|--------------------------|
| Univ. of California Davis, CA 95616 | Warren E. Johnston | \$38,418 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Univ. of California Davis, CA 95616 | Warren E. Johnston | \$27,254 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Univ. of Florida Gainesville, FL 32611 | J. S. Shonkwiler | \$76,808 | 09/15/84 | 03/31/88 | 8 Doctoral* |
| Univ. of Florida Gainesville, FL 32611 | J. S. Shonkwiler | \$54,536 | 09/15/84 | 03/31/88 | 8 Doctoral* |
| Univ. of Illinois Urbana, IL 61801 | William L. George | \$57,606 | 09/15/84 | 03/31/88 | 6 Doctoral** |
| Univ. of Illinois Urbana, IL 61801 | William L. George | \$40,902 | 09/15/84 | 03/31/88 | 6 Doctoral** |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD & AGRICULTURAL MARKETING

163

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|---|---------------------------|----------|-------------------|--------------|--------------------------|
| Univ. of Maryland College Park, MD 20742 | Rachel Dardis | \$43,206 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Univ. of Maryland College Park, MD 20742 | Rachel Dardis | \$27,268 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Michigan State Univ. East Lansing, MI 48824 | H. M. Riley | \$31,028 | 09/15/84 | 03/31/88 | 3 Doctoral |
| Michigan State Univ. East Lansing, MI 48824 | H. M. Riley | \$18,226 | 09/15/84 | 03/31/88 | 3 Doctoral |
| Univ. of Minnesota St. Paul, MN 55108 | Jerome W. Hammond | \$52,170 | 09/15/84 | 03/31/88 | 5 Doctoral |
| Univ. of Minnesota St. Paul, MN 55108 | Jerome W. Hammond | \$29,920 | 09/15/84 | 03/31/88 | 5 Doctoral |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD & AGRICULTURAL MARKETING

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|--|---------------------------|----------|-------------------|--------------|--------------------------|
| North Carolina State Univ. Raleigh, NC 27695 | R. K. Perrin | \$48,005 | 09/15/84 | 03/31/88 | 5 Doctoral |
| North Carolina State Univ. Raleigh, NC 27695 | R. K. Perrin | \$34,085 | 09/15/84 | 03/31/88 | 5 Doctoral |
| Ohio State Univ. Research Foundation Columbus, OH 43212 | J. Havlicek, Jr. | \$57,606 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Ohio State Univ. Research Foundation Columbus, OH 43212 | J. Havlicek, Jr. | \$40,902 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Oklahoma State Univ. Stillwater, OK 74078 | Daniel S. Tilley | \$48,005 | 09/15/84 | 03/31/88 | 5 Doctoral |
| Oklahoma State Univ. Stillwater, OK 74078 | Daniel S. Tilley | \$34,085 | 09/15/84 | 03/31/88 | 5 Doctoral |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD & AGRICULTURAL MARKETING

165

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|---|---------------------------|----------|-------------------|--------------|--------------------------|
| Univ. of Rhode Island Kingston, RI 02881 | Thomas F. Weaver | \$20,451 | 09/15/84 | 03/31/88 | 3 Doctoral |
| Univ. of Rhode Island Kingston, RI 02881 | Thomas F. Weaver | \$28,803 | 09/15/84 | 03/31/88 | 3 Doctoral |
| Texas Tech Univ. Lubbock, TX 79409 | R. C. Albin | \$38,404 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Texas Tech Univ. Lubbock, TX 79409 | R. C. Albin | \$27,268 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Washington State Univ. Pullman, WA 99164 | LeRoy Rogers | \$38,404 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Washington State Univ. Pullman, WA 99164 | LeRoy Rogers | \$27,268 | 09/15/84 | 03/31/88 | 4 Doctoral |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD & AGRICULTURAL MARKETING

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|--|---------------------------|----------|-------------------|--------------|--------------------------|
| Univ. of Wisconsin Madison, WI 53706 | Daniel W. Bromely | \$40,902 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Univ. of Wisconsin Madison, WI 53706 | Daniel W. Bromley | \$57,606 | 09/15/84 | 03/31/88 | 6 Doctoral |

TOTAL \$1,186,898

* This includes 4 Doctoral's in the Food Science/Human Nutrition National Needs Area.

** This includes 2 Doctoral's in the Agricultural Engineering National Needs Area.

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD SCIENCE/HUMAN NUTRITION

167

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|---|---------------------------|----------|-------------------|--------------|--------------------------|
| Alabama A&M Univ. Normal, AL 35762 | G. R. Sunki | \$20,064 | 09/15/84 | 03/31/88 | 4 Master's |
| Alabama A&M Univ. Normal, AL 35762 | G. R. Sunki | \$29,201 | 09/15/84 | 03/31/88 | 4 Master's |
| Tuskegee Univ. Tuskegee Univ., AL 36088 | Eloise Carter | \$25,257 | 09/15/84 | 03/31/88 | 3 Master's |
| Tuskegee Univ. Tuskegee Univ., AL 36088 | Eloise Carter | \$12,048 | 09/15/84 | 03/31/88 | 3 Master's |
| Univ. of Arizona Tucson, AZ 85721 | D. E. Goll | \$6,574 | 09/15/84 | 03/31/88 | 1 Master's |
| Univ. of Arizona Tucson, AZ 85721 | D. E. Goll | \$5,016 | 09/15/84 | 03/31/88 | 1 Master's |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD SCIENCE/HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|---|---------------------------|----------|-------------------|--------------|--------------------------|
| Univ. of California Davis, CA 95616 | R. B. Rucker | \$54,536 | 09/15/84 | 03/31/88 | 8 Doctoral |
| Univ. of California Davis, CA 95616 | R. B. Rucker | \$78,582 | 09/15/84 | 03/31/88 | 8 Doctoral |
| Univ. of Southern California Los Angeles, CA 90089 | S. P. Bessman | \$27,268 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Univ. of Southern California Los Angeles, CA 90089 | S. P. Bessman | \$78,234 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Univ. of Connecticut Storrs, CT 06268 | K. L. Knox | \$34,085 | 09/15/84 | 03/31/88 | 5 Doctoral |
| Univ. of Connecticut Storrs, CT 06268 | K. L. Knox | \$48,005 | 09/15/84 | 03/31/88 | 5 Doctoral |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD SCIENCE/HUMAN NUTRITION

169

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|---|---------------------------|----------|-------------------|--------------|--------------------------|
| Univ. of Georgia Athens, GA 30602 | Carolyn Berdanier | \$27,268 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Univ. of Georgia Athens, GA 30602 | Carolyn Berdanier | \$42,399 | 09/15/84 | 03/31/88 | 4 Doctoral |
| Kansas State Univ. Manhattan, KS 66506 | D. Y. C. Fung | \$58,804 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Kansas State Univ. Manhattan, KS 66506 | D. Y. C. Fung | \$40,902 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Univ. of Massachusetts Amherst, MA 01003 | R. G. Brown | \$48,005 | 09/15/84 | 03/31/88 | 5 Doctoral |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD SCIENCE/HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|---|---------------------------|----------|-------------------|--------------|--------------------------|
| Univ. of Massachusetts Amherst, MA 01003 | R. G. Brown | \$34,085 | 09/15/84 | 03/31/88 | 5 Doctoral |
| Tufts Univ. Boston, MA 02111 | Stanley Gershoff | \$40,902 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Tufts Univ. Boston, MA 02111 | Stanley Gershoff | \$57,978 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Michigan State Univ. East Lansing, MI 48824 | T. R. Dutson | \$13,634 | 09/15/84 | 03/31/88 | 2 Doctoral |
| Michigan State Univ. East Lansing, MI 48824 | T. R. Dutson | \$19,202 | 09/15/84 | 03/31/88 | 2 Doctoral |
| Univ. of Minnesota St. Paul, MN 55108 | Elwood Caldwell | \$19,575 | 09/15/84 | 03/31/88 | 3 Master's |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD SCIENCE/HUMAN NUTRITION

171

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|--|---------------------------|----------|-------------------|--------------|--------------------------|
| Univ. of Minnesota St. Paul, MN 55108 | Elwood Caldwell | \$14,679 | 09/15/84 | 03/31/88 | 3 Master's |
| Mississippi State Univ. Mississippi State, MS 39762 | Gale R. Ammerman | \$22,405 | 09/15/84 | 03/31/88 | 2 Master's, 1 Doctoral |
| Mississippi State Univ. Mississippi State, MS 39762 | Gale R. Ammerman | \$16,849 | 09/15/84 | 03/31/88 | 2 Master's, 1 Doctoral |
| Univ. of Nebraska Lincoln, NE 68583 | Chris R. Calkins | \$6,402 | 09/15/84 | 03/31/88 | 1 Master's |
| Univ. of Nebraska Lincoln, NE 68583 | Chris R. Calkins | \$5,016 | 09/15/84 | 03/31/88 | 1 Master's |
| Cornell Univ. Ithaca, NY 14853 | M. C. Nesheim | \$39,402 | 09/15/84 | 03/31/88 | 6 Doctoral |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD SCIENCE/HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|---|---------------------------|----------|-------------------|--------------|--------------------------|
| Cornell Univ. Ithaca, NY 14853 | M. C. Nesheim | \$59,106 | 09/15/84 | 03/31/88 | 6 Doctoral |
| Pennsylvania State Univ. University Park, PA 16802 | Arun Kilara | \$30,096 | 09/15/84 | 03/31/88 | 6 Master's* |
| Pennsylvania State Univ. University Park, PA 16802 | Arun Kilara | \$38,412 | 09/15/84 | 03/31/88 | 6 Master's* |
| Univ. of Tennessee Knoxville, TN 37901 | Hugh O. Jaynes | \$10,032 | 09/15/84 | 03/31/88 | 2 Master's |
| Univ. of Tennessee Knoxville, TN 37901 | J. T. Miles | \$12,804 | 09/15/84 | 03/31/88 | 2 Master's |
| Utah State Univ. Logan, UT 84322 | Jeffery K. Kondo | \$5,016 | 09/15/84 | 03/31/88 | 1 Master's |

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD SCIENCE/HUMAN NUTRITION

173

GRANTS AWARDED FOR FISCAL YEAR 1985

| ORGANIZATION | PRINCIPAL INVESTIGATOR | AMOUNT | AGREEMENT FROM | PERIOD TO | FELLOWSHIPS SUPPORTED |
|--|---------------------------|---------|-------------------|--------------|--------------------------|
| Utah State Univ. Logan, UT 84322 | Jeffery K. Kondo | \$6,402 | 09/15/84 | 03/31/88 | 1 Master's |

TOTAL \$1,088,245

* This includes 3 Master's in the Agricultural Engineering National Needs Area.

SCIENTISTS WHO SERVED ON USDA/S&E PEER REVIEW PANELS FOR FISCAL YEAR 1985

Scientists from government, universities, and industry served on USDA/S&E peer review panels this past year. Each panel was put together to fit the expertises needed for that specific granting area. The scientists involved are listed below alphabetically within their respective States.

ALABAMA

Cindy Brunner
Auburn University

James D. Harper
Auburn University

John A. Plumb
Auburn University

Ronald Young
University of Alabama

ALASKA

John A. Yarie
University of Alaska

ARIZONA

Ronald E. Allen
University of Arizona

Edwin H. Carpenter
University of Arizona

ARIZONA—continued

David K. Y. Lei
University of Arizona

Michael A. McClure
University of Arizona

John W. Radin
ARS-USDA

J. Glenn Songer
University of Arizona

ARKANSAS

Harry K. Dupree
U.S. Dept. of. the Interior

Timothy T. Ku
University of Arkansas, Monticello

Frederick M. Stephen
University of Arkansas

CALIFORNIA

Gary Anderson
University of California-Davis

Thomas C. Baker
University of California-Riverside

Michael L. Bruss
University of California-Davis

John M. Duniway
University of California-Davis

Mary K. Firestone
University of California-Berkeley

Graham A. E. Gall
University of California-Davis

John P. Hughes
University of California-Davis

CALIFORNIA—continued

Laurel J. Gershwin
University of California-Davis

Arthur R. Grossman
Carnegie Institution of Washington

Stephen H. Howell
University of California-San Diego

W. M. Jarrell
University of California-Riverside

Russell L. Jones
University of California-Berkeley

Christopher Lamb
The Salk Inst. for Biol. Studies

Bo Lonnerdal
University of California-Davis

Joseph G. Morse
University of California-Riverside

J. Brian Mudd
ARCO Plant Cell Research Inst.

Melvin Y. Okamura
University of California-San Diego

Ronald R. Sederoff
Forest Service-USDA

CALIFORNIA—continued

Wendy K. Silk
University of California-Davis

William C. Taylor
University of California-Berkeley

William F. Thompson
Carnegie Institute of Washington

William E. Timberlake
University of California-Davis

Judith R. Turnlund
ARS-USDA

Loy Elaine Volkman
University of California-Berkeley

Charles West
University of California-Los Angeles

David L. Wood
University of California-Berkeley

COLORADO

Rupert P. Amann
Colorado State University

J. C. DeMartini
Colorado State University

Karel Grohmann
Solar Energy Res. Institute

COLORADO—continued

William R. Jacobi
Colorado State University

Terry M. Nett
Colorado State University

Leonard D. Pearson
Colorado State University

George Seidel
Colorado State University

Stephen J. Wallner
Colorado State University

Frederick F. Wangarrd
Consultant

CONNECTICUT

Louis van der Heide
University of Connecticut

Dennis Knudson
Yale University

Michael E. Montgomery
Forest Service-USDA

DELAWARE

George H. Lorimer
E. I. Dupont De Nemours & Co.

DELAWARE—continued

Thomas K. Wood
University of Delaware

DISTRICT OF COLUMBIA

Marie M. Cassidy
George Washington University

Lawrence W. Hill
Forest Service-USDA

Richard A. Neal
Agency of International
Development

Howard Rosen
Forest Service-USDA

Neil A. Storms
Office of Rural Development
Policy, USDA

Steve Zobriski
CSRS-USDA

FLORIDA

Fuller W. Bazer
University of Florida

Lionel J. Beaulieu
University of Florida-IFAS

FLORIDA—continued

Peggy R. Borum
University of Florida

George E. Bowes
University of Florida

Francis F. Busta
University of Florida

Michael J. P. Lawman
University of Florida

J. T. Neilson
University of Florida

Herbert Oberlander
ARS-USDA

Daryl R. Pring
ARS-USDA

Robert A. Schmidt
University of Florida

Daniel L. Shankland
University of Florida

GEORGIA

R. Harold Brown
University of Georgia

Glenn A. Galau
University of Georgia

GEORGIA—continued

Robert W. Matthews
University of Georgia

Louis W. Schierman
University of Georgia

IDAHO

Alan L. Lambuth
Boise Cascade Technical Ctr.

ILLINOIS

Cleora J. D'Arcy
University of Illinois

Marvin O. Bagby
ARS-USDA

Wayne L. Banwart
University of Illinois

Robert W. Detroy
Signal-UOP Res. Ctr.

Phillip Dziuk
University of Illinois

Michael Irwin
University of Illinois

John B. Ohlrogge
ARS-USDA

Illinois—continued

Robert M. Skirvin
University of Illinois

Edward W. Voss
Northwestern Univ.

Judith Willis
University of Illinois

INDIANA

Arthur Aronson
Purdue University

Ray A. Bressan
Purdue University

Richard A. Dilley
Purdue University

Stanton B. Gelvin
Purdue University

Paul A. Hammer
Purdue University

Andrew O. Jackson
Purdue University

Michael R. Ladisch
Purdue University

INDIANA—continued

Stephen B. Lovejoy
Purdue University

P. V. Malven
Purdue University

Lee E. Sommers
Purdue University

IOWA

Lawrence H. Arp
Iowa State University

Billy L. Deyoe
ARS-USDA

Glynn H. Frank
ARS-USDA

Floyd G. Manwiller
Iowa State University

Reid G. Palmer
Iowa State University

Cecil R. Stewart
Iowa State University

Luisa Tabatabai
ARS-USDA

KANSAS

Richard D. Black
Kansas State University

Arun K. Chatterjee
Kansas State University

Embert H. Coles
Kansas State University

Karl Joseph Kramer
ARS-USDA

Sean Lynch
Kansas State Univ. Medical Ctr.

Rollins G. Sears
Kansas State University

KENTUCKY

Daniel A. Potter
University of Kentucky

LOUISIANA

Sue Bartlett
Louisiana State University

Thomas R. Klei
Louisiana State University

Robert Romaine
Louisiana State University

LOUISIANA—continued

J. Storz
Louisiana State University

MAINE

Michael-Sargent Greenwood
University of Maine

Christa R. Schwintzer
University of Maine

MARYLAND

Joel Bitman
ARS-USDA

Douglas Bolt
ARS-USDA

R. A. Bram
ARS-USDA

Ronald Fayer
ARS-USDA

Albert J. Guidry
ARS-USDA

Robert J. Maier
Johns Hopkins University

MARYLAND—continued

Warren W. Marquardt
University of Maryland

Caird E. Rexroad
ARS-USDA

Jerry Ritchie
ARS-USDA

Heven Sze
University of Maryland

Lila Vodkin
ARS-USDA

MASSACHUSETTS

Frederick M. Ausubel
Massachusetts General Hospital

Robert E. Blankenship
Amherst College

Helga Boedtker
Harvard University

Ring R. T. Carde
University of Massachusetts

Mary K. Mandels
U.S. Army

MASSACHUSETTS—continued

Allan A. Marra
University of Massachusetts

Mark Mount
University of Massachusetts

Priscilla A. Schaffer
Harvard Medical School

Peter L. Pellett
University of Massachusetts

John Gordon Torrey
Harvard University

Roy G. VanDriesche
University of Massachusetts

Daniel I. C. Wang
Massachusetts Institute
of Technology

MICHIGAN

Douglas Foster
University of Michigan

MICHIGAN—continued

Pamela J. Fraker
Michigan State University

James W. Hanover
Michigan State University

James R. Miller
Michigan State University

MINNESOTA

Martin E. Bergeland
University of Minnesota

Mark L. Brennen
University of Minnesota

John G. Haygreen
University of Minnesota

John A. Newman
University of Minnesota

Carolyn D. Silflow
University of Minnesota

Patricia B. Swan
University of Minnesota

MISSISSIPPI

John Deavers Hodges
Mississippi State University

MISSOURI

Harold Eugene Garrett
University of Missouri

Gray S. Henderson
University of Missouri

Tuan-hua David Ho
Washington University

Donald Miles
University of Missouri

Joseph C. Polacco
University of Missouri

Stephen G. Pueppke
University of Missouri

Stephen G. Rogers
Monsanto Company

Karel R. Schubert
Washington University

Louis A. Sherman
University of Missouri

MONTANA

Roland L. Barger
Forest Service-USDA

NEBRASKA

J. M. Daly
University of Nebraska

David W. Galbraith
University of Nebraska

James R. Gilley
University of Nebraska

John C. Osterman
University of Nebraska

Thomas Hugh Wise
ARS-USDA

NEW HAMPSHIRE

Thomas C. Harrington
University of New Hampshire

NEW JERSEY

Randy Gaugler
Rutgers, The State University

Richard A. Kramer
Hoffman-La Roche

Colin G. Scanes
Rutgers, The State University

NEW MEXICO

Steven D. Tanksley
New Mexico State University

NEW YORK

Philip Ammirato
Columbia University

Ronald E. Brooks
General Electric R&D Ctr.

Henry R. Bungay, III
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